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The Faces of New Guinea

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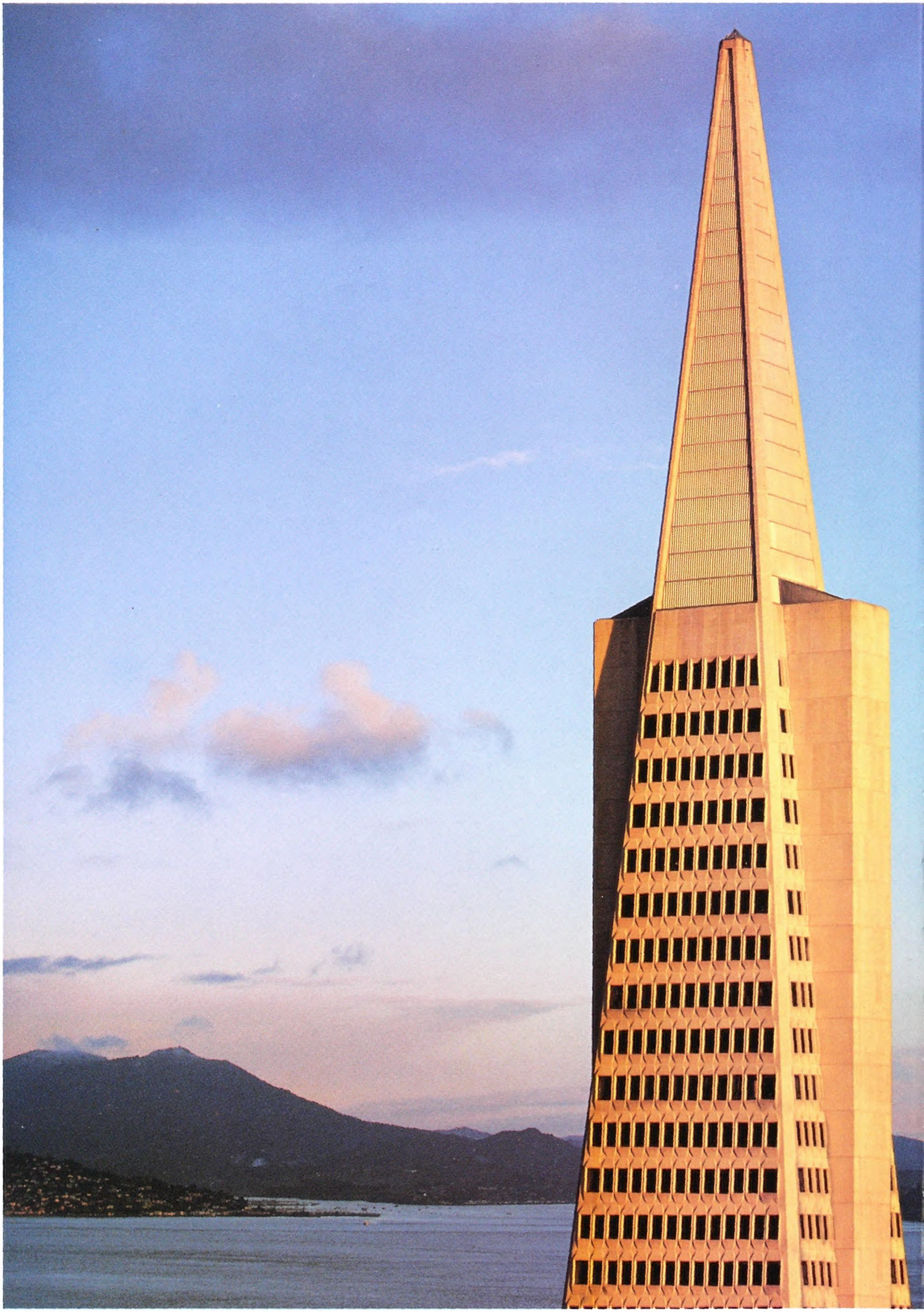

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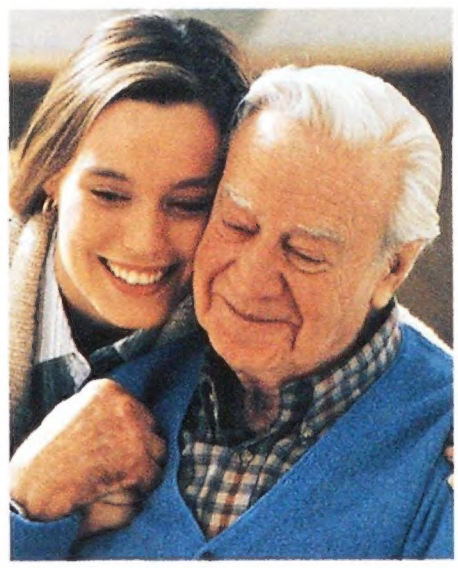

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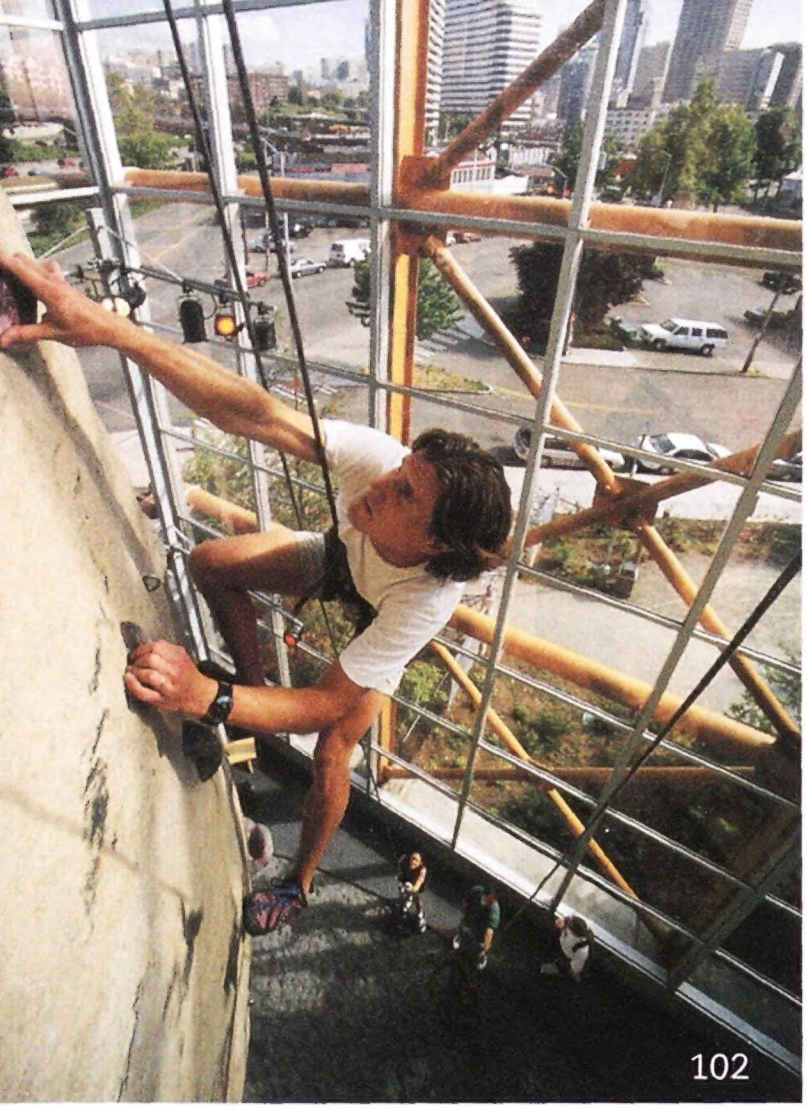

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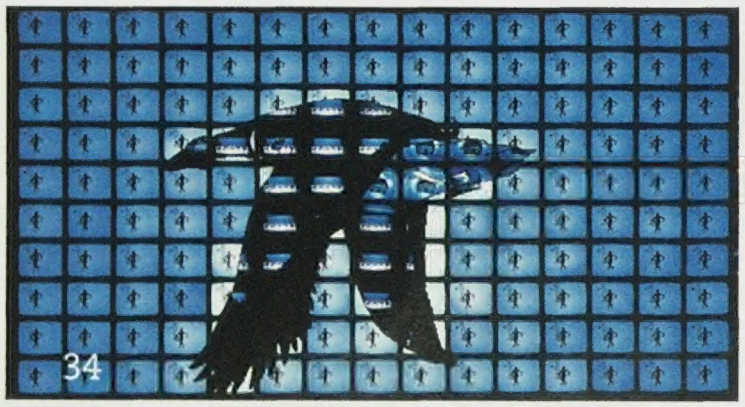
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Pam Hunt

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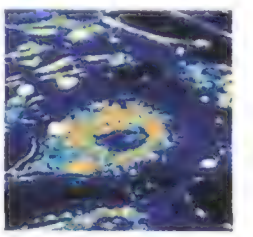

Cancer cells invade healthy cells.

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SMITHSONIAN PERSPECTIVES

An Illustrated History Of a Mughal Emperor

THE OPULENT PAINTINGS IN THE "KING OF THE WORLD" EXHIBITION BRING THE REIGN OF THE TAJ MAHAL BUILDER TO LIFE AND INCITE A PASSION FOR LEARNING

OCCASIONALLY, I HAVE DEVOTED THIS COLUMN TO A Smithsonian exhibition that has had a special personal impact. "King of the World: A Mughal Manuscript from the Royal Library, Windsor Castle" at the Arthur M. Sackler Gallery is one of these. It consists of paintings from a book celebrating the first ten years of the reign (1628-58) of the Mughal emperor Shah-Jahan of India. The manuscript was given to George III in the 18th century by the Nawab of Oudh, a ruler in eastern India, and has reposed in the Royal Library at Windsor Castle since the early 1830s. It has rarely been seen, and the occasion of this exhibition is the needed rebinding of the book. Milo Beach, director of the Freer and Sackler galleries, and a noted historian who has specialized in Islamic art and had studied the manuscript in detail some time ago, was asked to curate the exhibition and to cowrite the extraordinary volume that accompanies it. When the exhibition closes at the Sackler in mid-October, it will travel to New York City, Los Angeles, Fort Worth and Indianapolis. Be on the lookout for it.

A portrait depicts Shah-Jahan just before his son's wedding in 1637.

Why do I find it so special? First is the quality of the paintings, which document special events in Shah-Jahan's reign. (He, by the way, commissioned the Taj Mahal as a tomb for his wife Mumtaz.) They are done in meticulous detail and depict court ceremonies, hunts, weddings, battles and, quite notably, the beheading of a traitor. One can spend hours with the exhibition, most profitably with a magnifying glass to discover details otherwise overlooked. Bloodstains on the flies buzzing around the severed heads in the painting noted above are an example. The manuscript's illustrators, Beach explained, were not unlike 19th- or 20th-century court photographers, documenting all important events of the emperor's reign, the ceremonial and grisly alike.

The second reason for my special enthusiasm is an aftermath of my visit to the exhibition. Milo Beach's vivid explanations prodded me to begin filling an enormous gap in my knowledge of the histories of India, Pakistan, the countries that border them on the north and west, and the spatial and temporal extents of the triumphs of Genghis Khan and his successors, including Timur, a direct ancestor of Shah-Jahan. I spent a number of hours with encyclopedia articles and have graduated to the first autobiography in Islamic literature—the *Baburnama*, the memoir of Babur, the first Mughal emperor. A recent translation by Wheeler Thackston was published by the Freer and Sackler in 1996. Babur's sphere of influence in modern terms included the huge area of Uzbekistan, Tajikistan, Afghanistan, Pakistan, Bangladesh and northern India. He founded in 1526 what became the Mughal empire of India, and it lasted until 1858 under the rulership of many successors, one of whom was Shah-Jahan. I am only partway through the memoir as I write this column, but my enthusiasm is undiminished and could well be the beginning of a long-term interest.

The point of this narrative is evident. Museums fill many roles. An important one is to exhibit objects in a rich historical context that both educates and stimulates the viewer to continue to learn. Museums have the special advantage of authentic displays that focus the attention of most viewers in a way that surpasses words and illustrations. In "King of the World," we see the actual 17th-century paintings, with accompanying text, that begin our trip of both imagination and comprehension.

I. MICHAEL HEYMAN, SECRETARY

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STEEL MILLS

HAVING GROWN UP IN THE STEEL BELT, I was interested in Doug Stewart's August article on the steel industry. His description of the rolling mill only begins to convey the intensity and the horror of the operation where my father worked for 37 years. There was little regard for safety in the old days, and the men had to dance around the red-hot rods as they snaked across the floor. After each pass through the rolls, flakes of scale would fly through the air, lodging in men's eyes and ears, and falling inside their shirt collars and shoes. They were hot enough to stick and burn. On very hot days in the summer, my father came home with his shoes white from his own salt.

J. Robert Bridge
Columbus, Ohio

MY FATHER WORKED AT U.S. STEEL IN Duluth, Minnesota, and Gary, Indiana, for more than 30 years. Could you send a copy of the piece to Lee Mooers, address: Heaven? I know he's not in hell, because as every steelworker can tell you, they've already been there.

Jeneen Mooers Martin
Florence, Wisconsin

WHAT IS SIGNIFICANT IN YOUR STORY is that it recognizes that the vast acres of industrial buildings do not alone tell the story. Rather, it is the exceptional workers (such as my father, a skilled toolmaker) who day in and day out kept the steel plants operating, along with the close-knit neighborhoods that surrounded them.

George R. Bellamy
Matthews, North Carolina

TREE HOUSES

I ALMOST WISH I WERE YOUNG ENOUGH and spry enough to vacation in a tree house. I live in a condo, which is philosophically and physically about as far from a tree house as one can get. Suki Casanave had some fascinating material, but she left out the tree house that my generation remembers, the marvelous one built by Tarzan for Jane. It had all the amenities that were available in the area, including an elephant-powered elevator.

Harriette Shulman
Fort Lauderdale, Florida

In the 1939 film *Tarzan Finds a Son!*, Tarzan (Johnny Weissmuller) and Jane (Maureen O'Sullivan) feed Boy in his treetop "crib."

SUKI CASANAVE'S ARTICLE ON TREE houses was very exciting for me because the "70-year-old" New Jersey man who had the famous elevator tree house was my grandpa, Haig Markarian. He died before I was born, but I'm proud that people are still talking about him and his tree house 20 years after he built it. I'm honored to have my grandpa in the magazine, and he would have been honored, too, because he enjoyed reading SMITHSONIAN.

Christina Ann Nelson
Richmond, Virginia

YOUR ENTERTAINING ARTICLE ON TREE houses overlooked perhaps the most significant connection to Britain's royal family. In February 1952, Princess Elizabeth was on a royal visit to East Africa. She spent one night at Treetops, a hostel built overlooking a water hole in a Kenya game preserve. That night Elizabeth's father, King George VI, died in England. She ascended the tree house as a princess and descended as a queen.

Dwight Wilder
Somersworth, New Hampshire

BANGALORE

SIMON WINCHESTER'S "THE LEGACY," about the vestiges of British influence in India 50 years after the end of the Raj, stirs the wellsprings of memory among former India hands.

It was Calcutta's Harington Street, not Shakespeare Lane, that was renamed Ho Chi Minh Sarani. In the winter of 1968-69, the Communist Party of India (Marxist) won the election in West Bengal and promptly changed the street name. Both the American Consulate General and the British Deputy High Commissioner had their offices on Harington Street. We Americans, in particular, had a problem. U.S. forces were engaged in the war in Vietnam, and we wondered whether we should receive our mail at No. 5/1 Ho Chi Minh Sarani or try to wriggle out of the dilemma by adopting the address of our Consular Section on Little Russell Street. Our concern was that the Indian press would have a heyday if we resorted to that kind of subterfuge. We swallowed our chagrin and accepted the new name as gracefully as we could.

Richard T. Davies
U.S. Consul General, Calcutta (1968-69)
Silver Spring, Maryland

I READ SIMON WINCHESTER'S PATRONizing article about my hometown, Bangalore, with growing incredulity and disdain. He eloquently yet speciously rationalizes that all that is good in

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INTRIGUE

A SOPHISTICATED TWIST ON A SPORTS SEDAN

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India is British and all that is bad is Indian, and Winchester is surprised that Indians are anything but humbly grateful for the allegedly rich legacy left by the British.

Yes, the British did leave "legislative assemblies, courts, bureaucracies, railways, roads, [and] telephones," but no matter how valiantly Winchester attempts to perfume the corpse of colonialism, the British were in India for a single, paramount purpose: to purloin the famed riches of its 5,000-year-old civilization. The "Jewel in the Crown" served to boost the nascent Industrial Revolution by providing cheap raw materials, capital and a large captive market for British industry. All of the "legacy" institutions were set up by the British simply to better facilitate this duplicitous plunder.

Sanjiv Augustine
Annandale, Virginia

FLOODS

NOT TO COIN A PHRASE, BUT MY GORGE rises and gets all choked up every time I read or hear the words "flood damage." Your article names flooding as the single most costly natural disaster in the world today. To my knowledge, it is the only severe natural disaster that the picayune little organization we call humanity can eliminate or at the least hold to a livable minimum.

The story was rescued by a codicil near the end in which some California scientists call for a close, global look at long-term flood cycles and advocate allowing rivers to reconnect with their floodplains while restricting development on flood-prone areas. The answer is, "The flood plain belongs to the river." Always has, and always will. And what we can expect is that rivers will flood.

William A. Wertz
Tyrone, Pennsylvania

POKER

AS MUCH AS WE ALL ENJOYED PARTICipating in and reading Nancy Shute's article about poker, the Saturday Night Crew from Playa Del Rey felt you omitted a couple of things that are important to us. First, the table we play on is a one-of-a-kind, seven-sided poker table handmade by Kelly's ("the hostess") late dad many years ago.

Second, we haven't completely "given up the money." All markers in our ledger come due the day our group lottery ticket comes in.

Marc Gilutin
Playa Del Rey, California

NANCY SHUTE'S "FAKE & RAKE" DEALT me a delightful hand of poker. In the 1950s, while a graduate student, I commuted by train from Atlantic City to Philadelphia on the early-bird special. I was particularly fascinated with the last car on the line, which had been custom-tailored for the regular poker players and the observers like me. Seats had been taken out and rearranged, and tables had been installed to allow the game to be played with the comforts of home.

I have no idea how long this had been going on nor do I know how long it lasted, but I'm certain those railroad-car card-playing customers would never have traded their daily commute and daily game for all the casinos in Atlantic City today.

Bernard Whitman
King of Prussia, Pennsylvania

OBJECT AT HAND

I ENJOYED THE FINE ARTICLE BY EDwards Park on daguerreotypist Augustus Washington and his portrait of abolitionist John Brown. Washington had an interesting life in Liberia. He served in a number of governmental positions, and later, in private life, he became the editor and publisher of the Monrovia *New Era*, the newspaper that served the Liberian capital and was the paper of record for that period. After a long and distinguished career, Washington died in Monrovia on June 7, 1875, at the age of 54.

Reginald H. Pitts
Philadelphia, Pennsylvania

GEORGE C. MARSHALL

GEN. GEORGE C. MARSHALL IS THE only career military man ever to be awarded the Nobel Prize for Peace. That is the epitome of the Virginia Military Institute's stated mission of producing citizen-soldiers.

Leonard Wagner
Bayonne, New Jersey

IN YOUR INTERESTING ARTICLE, "THE Last Great American?" you erred in stating that Gen. George C. Marshall served as "General Pershing's chief of staff in World War I." He served as Pershing's aide-de-camp.

Robert Fellows
Jackson Heights, New York

AROUND THE MALL & BEYOND

IN MICHAEL KERNAN'S MOST ENJOYable column on the space race he referred to rocketeer Wernher von Braun and Germany's rocket test facilities at Peenemünde. I vividly remember the moment in 1974, while I was sitting with Von Braun at an Aviation/Space Writers convention in Washington, D.C., when World War II fighter pilot Col. Bill McGinty came over, put his arm around both of us and said he had strafed Peenemünde up and back on several missions and yet there we were, together. Von Braun bristled and retorted sternly, "It also means you vas a lousy shot!"

Col. Barney Oldfield, USAF (ret.)
Beverly Hills, California

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Two Cultures—Never The Twain Shall Meet?

SCIENTISTS WONDER WHY TODAY THE WORD "INTELLECTUAL" IS USED TO DESCRIBE ONLY THOSE IN ARTS AND LETTERS

BY JOHN P. WILEY, JR.

LITERARY THEORISTS SHOULD BE MADE TO WEAR a patch over one eye, keep a parrot on their shoulder and always carry a bottle of rum. That way it will be easier for the rest of us to recognize them for the pirates they are. These modern-day buccaneers do it without pistols and cutlasses; they leave no bodies and sink no ships, and yet they make off with real treasure: an honored place in society and the unquestioning respect of us common folk.

What they have abducted is the title "intellectual." For most people, I think, the word refers to people who work in literature and the arts, not the hard or even the soft sciences. *Webster's Third* makes it official: "a person devoted to matters of the mind and esp. to the arts and letters: one given to study, reflection, and speculation esp. concerning large, profound or abstract issues." As you work your way through the entry, though, things do not go so well for the literary types. Farther down is this less flattering definition: "a person claiming to belong to an intellectual elite or caste, given to empty theorizing or cerebration, and often inept in the solution of practical problems." A quotation from the conservative writer Russell Kirk is even worse: "Intellectual is an ugly word . . . it implies consummate snobbery." Whether people perceive the word as good or bad, or are indifferent to it, most today associate "intellectual" strictly with the art and literature crowd.

People will say of a science story: "I didn't understand a word of it." They say it in a tone of satisfaction, as though happy they had not sullied themselves.

The abduction metaphor goes further. Intellectuals are now to be found only on the campuses of colleges and universities. Ten years ago cultural historian Russell Jacoby argued in *The Last Intellectuals* that the day of the independent intellectual, a learned person without a university base who wrote for a general, if intelligent, audience was over. Universities had abducted the intellectuals. And one year later, Lawrence W. Levine published *Highbrow/Lowbrow*, in which he charged that Shakespeare himself had been abducted by academe. In the 19th century, he said, Shakespeare companies toured the nation's small and medium-sized towns as well as the cities, and it was not uncommon for ordinary citizens to be as familar with the works of the bard as many Italians in all walks of life are with opera. The professors were able to make Shakespeare intimidating, a subject open only to those with specialized training, he charged, scaring off the rest of us.

Then there came in 1995 *The Third Culture* by John Brockman. (I've only caught up to it now thanks to its being mentioned in a review of a millennial apocalyptic art exhibition. The organizers had confused the age of the Solar System with the age of the Universe, and the reviewer went on about how art people couldn't care less, mentioning the book in the process.) The title picks up on a 1959 book by British physicist and novelist C. P. Snow called *The Two Cultures and the Scientific Revolution*. The two cultures were the intellectuals and the scientists. The twain did not meet, he pointed out; each group lived in its own universe. The split was not new; Snow noted that in the 1930s, literary theorists had begun to use the word "intellectual" to refer only to themselves. He envisioned a third culture in which the two groups would actually talk to each other.

In Brockman's book Murray Gell-Mann, a Nobel physicist now working on complex adaptive systems at the Santa Fe Institute, points out that "there are people in the arts and humanities . . . who are proud of knowing very little about science and technology, or about mathematics." (As a science editor, I run into that attitude all the time. People who have read a science story I've edited will say, with a proud smile: "I didn't understand a word of it." They say it in a tone of real satisfaction, as though happy they had not sul-

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lied themselves with the techno-geek side of life.) Gell-Mann went on to say: "The opposite phenomenon is very rare. You may occasionally find a scientist who is ignorant of Shakespeare, but you will never find a scientist who is *proud* of being ignorant of Shakespeare."

When I was young, it was understood that an "educated person" would know the classics; history; literature, art and music, and be at least generally familiar with the sciences. No one could know everything, of course, but it was possible to have a frame of reference. Standards were high: an educated person, we were told in high school, never reads something in translation. Needless to say, I never made the grade, but as the years went by some of those same criteria became part of my own definition of an intellectual: being aware of the intellectual trends of the day, reading in several languages, having a familiarity with literature and music. In my mind this person lived in a large city, was not affiliated with a university, and spent at least some of her time in coffeehouses reading obscure publications. (Until recently I always pictured her framed in a curl of cigarette smoke.) She didn't have much money, but she always vacationed in Europe.

"What went on in the chemistry or biology labs was beneath contempt for these intellectuals who were in touch with Plato and Aristotle and Julius Caesar. Such people . . . are suddenly scared."

It all has to do with matters of the mind. And yet even I, erstwhile backyard astronomer, erstwhile naturalist, continuing science buff, have all these years allowed myself to be taken in by the abduction scheme. One compartment of my mind was awed and inspired by how much the human mind has been able to discover about the unimaginably small and the unimaginably faraway. Yet in another compartment an intellectual was still that person in the coffee bar, reading a long piece about the newest star among French philosophers, a piece written in German.

Brockman, a writer and literary agent himself, believes that the best scientific work ranks as high as any other endeavor in the great achievements of the human mind. His title refers not to the coming together that Snow envisioned but a new culture in which scientists whose work transcends the barriers of their particular disciplines are taking their ideas directly to the public. Their books are bought and—contrary to common belief—read, Brockman asserts.

The main body of the book is divided into sections on evolutionary biology, computers and consciousness, cosmology and complex systems. Brockman interviewed the scientists and stitched their replies into essays on what they do. Anyone wanting to know where science is today could do a lot worse than read this compilation. Many of the names are familiar because they have been writing for the public: Stephen Jay Gould (*Wonderful Life*), Richard Dawkins (*The Selfish Gene*), Steven Pinker (*The Language Instinct*), Nicholas Humphrey (*The Inner Eye*), Roger Penrose (*Shadows of the Mind*), Alan Guth (*The Inflationary Universe*), Paul Davies (*The Last Three Minutes*) and Stuart Kauffman (coauthor of *At Home in the Universe*).

Before they get into what they do, however, most have a word or two to say about what has happened to the word "intellectual." Gould points out that the British Nobel Laureate Peter Medawar has "said it was unfair that a scientist who didn't know art and music pretty well was, among literary people, considered a dolt and a philistine, whereas literary people don't think they need to know any science in order to be considered educated."

Richard Dawkins: "I do feel somewhat paranoid about what I think of as a hijacking by literary people of the intellectual media."

Paul Davies: "Few intellectuals in Britain make any attempt to understand science, and clearly feel out of their depth with the issues being presented in recent books such as Stephen Hawking's *A Brief History of Time*. Some of the backlash seems to stem from a sense of helplessness in the face of this ignorance. 'I'm well educated,' they say, 'and I can't make sense of this. Therefore it must be bunk!'"

Nicholas Humphrey: "There's terror among the British intelligentsia that culture has passed them by. They went to school, learned their classics, learned their English literature, thought of scientists as some kind of nerds. What went on in the chemistry or biology labs was beneath contempt for these intellectuals who were in touch with Plato and Aristotle and Julius Caesar. Such people, who are used to being dominant in our culture, are suddenly scared."

Now science cannot tell us everything. Molecular biologists will never be able to explain the U.S. submarine commander in World War II who, under attack and badly wounded in the conning tower, ordered his crew to "take her down." But scientists have looked at the world with wonder, and they can tell us that the world is more wonderful than we ever imagined. Serious physicists are saying it may be possible to create a universe in the laboratory out of no more than 20 pounds of matter. Brockman charges that the culture of the people we now think of as the American intellectuals "is chiefly characterized by comment on comments." But it would seem that the most original, most exciting work of the mind these days is being done by scientists, and that if anyone should be included in the ranks of the intellectuals, they should.

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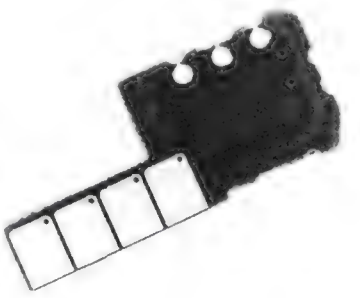

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THE OBJECT AT HAND

Facing a Bumpy History

THE MUCH-MALIGNED THEORY OF PHRENOLOGY GETS A TIP OF THE HAT FROM MODERN NEUROSCIENCE

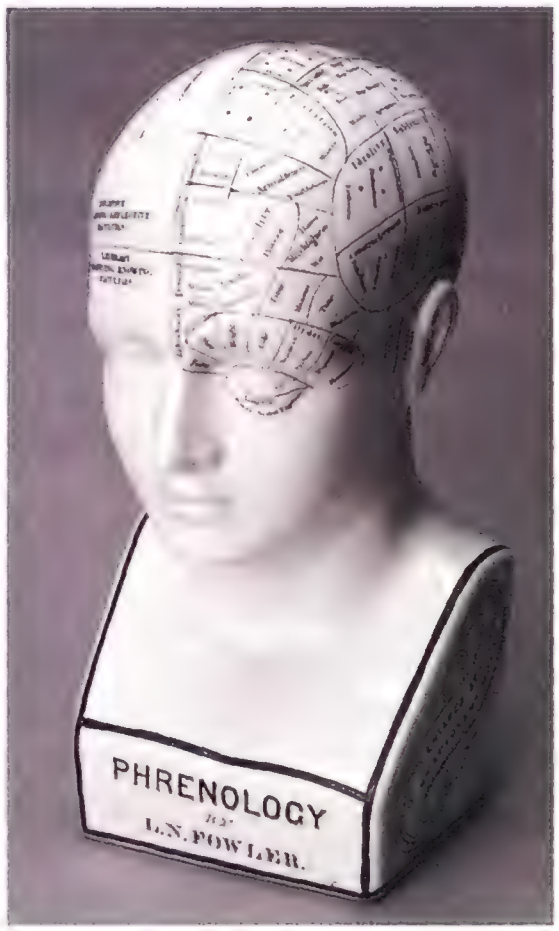
BY MINNA MORSE

IN LONDON IN 1873, MARK TWAIN saw an advertisement for the services of a fellow American who had hung out a shingle on Fleet Street. At once inspired and skeptical, Twain made his way to the offices of Lorenzo N. Fowler, "practical phrenologist."

"I found Fowler on duty," Twain wrote, "amidst the impressive symbols of his trade. On brackets, on tables . . . all about the room, stood marble-white busts, hairless, every inch of the skull occupied by a shallow bump, and every bump labeled with its imposing name, in black letters."

During the 19th century, thousands of busts like those Twain described were manufactured and sold by Fowler and others. One of them—its surfaces inked with lines showing the location of such traits as "Conjugality" and "Combativeness"—is on display at the American History Museum's "Science in American Life" exhibit, surrounded by other measures of human intellect and personality.

According to the "science" of phrenology, an individual's character and abilities could be deduced from the size and shape of various bumps on the head. By the time Twain visited Fowler, phrenology had developed an enormous following, especially in America. Characteristics such as verbal memory, "Amativeness" and "Secretiveness" were supposed to be controlled by corresponding areas, or "organs," of the brain. The more developed the trait, the larger the organ, and the larger a protrusion it formed in the skull. Phrenologists also believed that such traits—and their respective organs—could be modified through the practice of restraint or by the conscious "exercise" of a positive quality.



"Practical phrenologist" L. N. Fowler sold hundreds of busts like this one.

In the 20th century, phrenological busts have become comic conversation pieces, their images often used to patronize the past. Phrenology's failings are indeed obvious, but in our modern dismissal of it, its tremendous impact on 19th-century society can easily be forgotten. And despite its shaky scientific foundations, phrenology is enjoying a measure of respect from those who study the brain today.

Like another theory of mind that later permeated American culture, phrenology was the brainchild of a Viennese physician fascinated by the human psyche. Even as a schoolboy in the late 1700s, Franz Joseph Gall noticed that classmates who could memorize long passages with ease all seemed to have prominent eyes and large foreheads. From this he inferred that an organ of verbal memory must lie behind the eyes. He speculated that if one ability was "indicated by an external feature," others might be also.

His expanded theory brought Gall renown, but also the disapproval of church authorities, who considered such ideas heretical. In 1802, the state prohibited him from promoting his theory in Austria. Not surprisingly, this only increased public interest. Gall began lecturing throughout Europe and in 1805, with his protégé and former student, Johann Kaspar Spurzheim, he left Austria for good.

In the early years of the 19th century, Gall's ideas spread across Europe. But it was in America, a country starved for a "scientific" insight into the human mind (and one that offered the hope of individual perfectibility—read "self-help"), that phrenology would find its most devoted and enduring audience. And it was Spurzheim, having further expanded Gall's theory and adopted the name "phrenology," who would bring it to our shores.

Spurzheim arrived in 1832 for a whirlwind lecture tour—one that literally killed him after just six months. But in that short time, he converted thousands, lecturing at Harvard and Yale, and across the American heartland. Ralph Waldo Emerson described him as one of the world's greatest minds. After Spurzheim's death, John James Audubon sketched his remains

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for posterity; Harvard president Josiah Quincy handled his funeral arrangements. "The prophet is gone," the *American Journal of Medical Sciences* declared, "but his mantle is upon us."

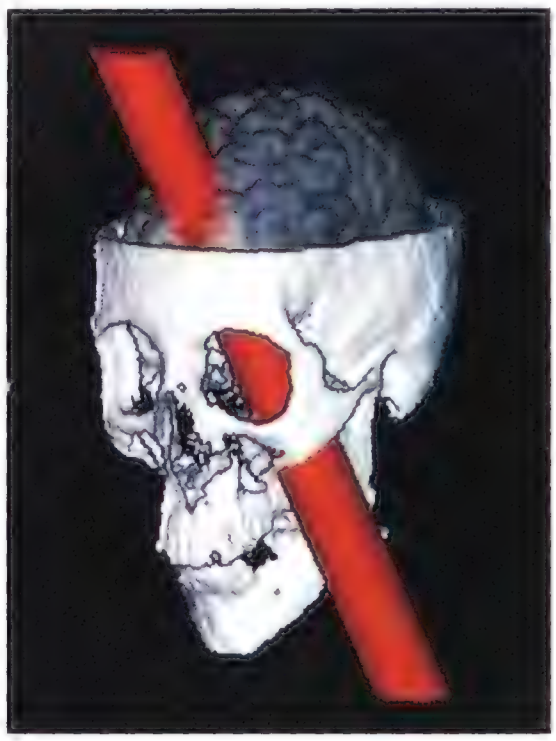
The mantle fell, in large part, to a ministry student named Orson Fowler, who suddenly found his true calling in Spurzheim's theory and polemical practice. Fowler began to lecture on the topic to his classmates at Amherst College in Massachusetts, and to offer "readings" for 2 cents apiece. In one friend, the future Rev. Henry Ward Beecher, Fowler reported finding evidence of a "strong social brain" with "very large Benevolence."

Orson's enthusiasm infected his younger brother, Lorenzo, along with the rest of the family. The two Fowler brothers—frustrated evangelists both—began touring the country, carrying "the truth of phrenology" from town to town, lecturing and offering readings, analyzing the character and propensities of utter strangers from the bumps and valleys on their skulls. (In one of his early sessions, Lorenzo Fowler studied the head of a shy 15-year-old named Clara Barton. Years later, in her memoirs, the founder of the American Red Cross recalled Fowler's comments: "She will never assert herself for herself—she will suffer wrong first—but for others she will be fearless.")

America quickly became cranium-conscious. Employers advertised for workers with particular phrenological profiles—even asking for a reading by the Fowlers as a reference. Women began changing their hairstyles to show off their more flattering phrenological features. Everyone, from small-town folk to the rich and famous, sat for readings, including such notables as Horace Greeley and Brigham Young. (Predictably, P.T. Barnum scored high in all traits but "Cautiousness.")

By the 1840s, the Fowlers' New York office, known as the Phrenological Cabinet, had become one of the most-visited attractions in town, serving as a bizarre museum that included phrenological portraits of hundreds of famous people's heads. (At least one of them was specially commissioned, post-mortem. After the 1836 death of Aaron Burr, the Fowlers ordered a cast of the deceased's head, and found, upon examination, that Burr's organs of "Secretiveness" and "Destructiveness" were—not surprisingly—far larger than those of the average person.)

From small-town folk to the rich and famous, everyone sat for readings.



Depending on when the diagnosis was made, 19th-century railroad worker Phineas Gage injured either his organ of "Benevolence" or a key area of his prefrontal cortex.

As publishers, the Fowlers churned out the *American Phrenological Journal and Miscellany* (which remained in print until 1911), along with countless volumes on phrenology and its applications to health and happiness, including guides to phrenological parenting and the proper choice of a mate. They also printed the first volume by a young writer named Walt Whitman.

When Emerson, after reading a manuscript of *Leaves of Grass*, famously wrote to its author, "I greet you at the beginning of a great career," the letter was addressed in care of the Fowlers. In the book itself, the Fowlers' influence is clear: "Who are you indeed who would talk or sing of America?" Whitman wrote. "Have you . . . learn'd the . . . phrenology . . . of the land?" So pleased was Whitman with his own phrenological reading ("large hope and comparison . . . and causality") that he would quote it time and time again in his writings.

Edgar Allan Poe also regularly wove phrenological concepts into his work, even employing cranial descriptions in an 1850 series of sketches of New York literary figures. (Of William Cullen Bryant, he wrote, the "forehead is broad, with prominent organs of Ideality.") Charlotte Brontë's work is also laced with phrenological analyses. Herman Melville's *Moby-Dick* even offers a lengthy (albeit mocking) phrenological description of the great whale.

Because phrenological theory espoused the idea of perfectibility, social reformers quickly latched onto it. Horace Mann regarded phrenology as the greatest discovery of the age. The Fowlers themselves became vocal advocates of reform and self-improvement, sometimes through advice on the proper phrenological choice of a career, but also with regard to education, temperance, even prison reform.

Of course, there were always skeptics—not least of them, Mark Twain, who recounted with horror that Fowler had found on his skull "a cavity" where humor ought to be. John Quincy Adams is said to have wondered how two phrenologists could look each other in the eye without laughing. But phrenology sailed on, pretty much unscathed, and until the turn of the century, continued to have an enormous impact on the public's ideas about the mind.

So pervasive was it that as late as 1888, the editors of the *Encyclopaedia Britannica*, wanting to debunk it in the name of reason (not to mention com-

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mon sense), felt compelled to publish a detailed, seven-page refutation of it.

Gall's "so-called organs," the *Britannica* declared, "were for the most part identified on slender grounds . . . made by an induction from very limited data." In some cases, the exponents of phrenology "have discovered coincidences of a surprising nature." But more often than not, such coincidences did not occur, and, the *Britannica* complained, when they did not, the phrenologists were apt to simply rationalize away the inconsistencies.

By the 20th century, phrenology had lost any shred of scientific authority, except among a few diehards. But the *Britannica* had included in its lengthy attack a perceptive prediction: "Based, like many other artificial philosophies, on an admixture of assumption and truth, certain parts will survive and become incorporated into scientific psychology, while the rest will in due course come to be relegated to the limbo of effete heresies."

The phrenologists were, in many ways, "quite astounding" for their time.

And so it proved. Though phrenology fell into deserved disrepute, modern scientists note that in some ways it was remarkably prescient. As early as 1929, in his *History of Experimental Psychology*, Harvard psychologist Edwin G. Boring wrote that "it is almost correct to say that scientific psychology was born of phrenology, out of wedlock with science."

It had, after all, an understanding that physiological characteristics of the brain influence behavior and—conversely—that behavior can alter our very physiology. (Of course, today scientists look at changes in neurochemistry and synaptic connections rather than "brain organs," but the principle is the same.) Phrenologists also reckoned that the mind is not unitary but composed of independent faculties. Their ideas—in other guises—have since given birth to the field of cognitive psychology, which breaks down mental functions (such as reading) into separate faculties (letter recognition, sentence comprehension and so forth).

Perhaps most interesting is the idea that different mental functions are localized in the brain. One of the first scientists to provide evidence of this localization of function was a contemporary of the Fowlers. In 1861, Paul Broca, a French surgeon and anthropologist, showed that damage to a particular region of the brain—only about

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four square centimeters in size—can make a person unable to speak coherently, without affecting his or her comprehension of others' speech.

"The phrenologists were definitely on the right track in that regard," says Marcus Raichle, a neuroscientist at Washington University in St. Louis. "The problem is where they took it."

According to Antonio Damasio, a neuroscientist at the University of Iowa College of Medicine, the phrenologists were, in many ways, "quite astounding" for their time. "However, they did not understand that even the areas we *have* identified—quite different from their 'organs'—are interdependent parts of larger 'brain systems.'" Damasio, who studies the effects of lesions in the brain, believes he has located an area in the prefrontal cortex that is part of a system crucial to controlling inappropriate behavior and considering the emotional repercussions of one's actions. One of the most dramatic cases he has studied provides a suggestive link between 19th-century phrenology and modern neuroscience.

It involves a New England railroad worker named Phineas Gage who, in 1848, suffered an amazing accident: an iron bar, more than an inch in diameter, was thrust by an explosion through his brain, entering his head under his cheekbone and exiting at the top of his skull. That he lived was astounding; even more remarkable, his reasoning and language were left entirely intact. What changed, however, was his temperament. Previously a responsible, gentle man, Gage was now argumentative, irresponsible and prone to cursing so vilely that women were warned not to remain in his presence.

Using Gage's actual skull as a guide, Damasio and his wife, Hanna, a fellow neuroscientist, recently created a 3-D computer image of Gage's injury (p. 26). The bar's trajectory, they found, had damaged the same region of the brain as had been injured in patients of theirs who exhibited similar behavior.

Back in 1848, the diagnosis was only somewhat different. Along with all the doctors and journalists who came to observe him, Gage was visited by Nelson Sizer, a phrenology expert and associate of the Fowlers.

The meeting provides further evidence that faulty logic can sometimes lead to correct conclusions. After comparing Gage's exit wound with his phrenological charts, Sizer determined—and accurately, no doubt—that Gage's change in demeanor, his violence and rudeness, were due not to damage in the prefrontal cortex but to an injury "in the neighborhood of Benevolence and the front part of Veneration."

AROUND THE MALL & BEYOND

Pushing the Envelope

AT THE NATIONAL POSTAL MUSEUM, ENVELOPES ARE AS CRITICAL A PART OF HISTORY AS THE LETTERS INSIDE

BY MICHAEL KERNAN

IN READING THE VARIOUS NEWSletters and calendars published by the Smithsonian, I have decided that the Institution is rather like Cairo: you can find just about anything here.

I see that one Maynard Benjamin gave a slide lecture on the history of envelopes at the National Postal Museum recently. He has also written a book on the subject, and he signed copies after the lecture, held in conjunction with two Postal Museum shows, "Undercover: The Evolution of the American Envelope" and "The Graceful Envelope," featuring beautifully handcrafted works by designers and calligraphers from around the world. The Postal Museum is one of my favorites, if only for the architecture—it's in the magnificent 1914 Washington City Post Office Building, right next to the equally grand 1908 Union Station.

Benjamin is a stamp collector with a special interest in the Civil War, which is why he belongs to the Confederate Stamp Alliance. He lives in Alexandria, Virginia, and he happens to be the president of the Envelope Manufacturers Association.

According to Benjamin, it was the Babylonians who first thought of enclosing clay tablets in clay "envelopes" baked hard around their contents.

I'm going to have to slip off the track here, already. It seems to me that the envelope must have been invented by that mythic emperor who wrote a message on the shaved pate of a slave, let the hair regrow, and sent the man to his destination to be shaved anew and read. The only drawback with this ingenious plan is that the message had better not be terribly urgent.

"No one knows when envelopes came to China," Benjamin announced, "but we do know that by 1200 B.C. the Chinese had developed a crude form of paper made from reeds and rice." Presumably they would protect the letter with a paper casing. The ancient Egyptians protected missives by rolling up the papyrus scrolls. Because paper was so expensive, for many centuries letters were usually just folded, sealed and sent that way. But by the 17th century separate envelopes appeared in Spain and France.

And what a relief that must have been. We have some English friends who still insist on using those tissue-paper aerograms dating from the 1930s. You write the letter, fold it, lick some gummed flaps, and suddenly your letter has turned itself into an envelope.

The trouble is, our friends keep having afterthoughts, and they write all over the margins. No matter how carefully we cut open the flaps, we lose vital information. As in, "Yes we'd love to have you visit, but we'll be out of town after the first of . . ."

The early envelopes were often sealed with wax impressed by a signet ring to prevent the wrong people from reading them. For a really important letter a gallows mark could be put on the cover, meaning that it had to be delivered under pain of death.

That seems to me an empty threat. If you didn't receive it, how would you know? And since letters sometimes took months to deliver, the derelict postman would have absconded long since, anyway. Benjamin explains that you might actually have been able to trace it, as each wayside kept a record of passage.

Envelopes presented a prime space for getting a message across. Here, envelopes from the 1860s to the 1890s tout everything from patriotism to pianos.

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It was Louis XIV of France, that master of the dramatic flourish, who popularized the use of a cover to ensure the privacy of letters, according to Benjamin. Louis had his secretary cut out forms with a template and fold and paste them to make envelopes for his communications to his court.

In America, Benjamin Franklin is known as the father of our postal service, hiring on in 1737 under the postmaster general for the Colonies. Franklin organized distribution, designed pigeonholes for collecting letters that were bound for the same place, and set milestones along the post roads, for in those days postmen were paid by the mile. It cost Samuel Adams, for instance, 11 pence in 1775 to send a letter from Boston to Philadelphia.

It is all too easy to veer off into a discussion of stamps here, or of the letters themselves, but I am determined to concentrate on the subject at hand. It just occurred to me: letter writing is coming back these days via e-mail and faxes, but what about the envelopes? In the virtual world, free of floods, fire and puppies, there is no need to protect your letter from damage. Benjamin notes, however, that most people still prefer the esthetic advantages of paper for personal letters and résumés.

Of course, in the days of the Pony Express, letters needed special protection. Already enveloped, they were then wrapped in oil silk and stuck into the four pockets of the mochila, a leather sling that fit over the saddle.

At that, the letters were still in for a rough ride. In 1860, "Pony Bob" Haslam, galloping up to an outpost on his exhausted horse, found it a smoldering ruin, the stationmaster killed and the spare horses stolen. Bob had to ride on, covering 120 miles in eight hours and ten minutes. When he reached safety he said he was a little tired.

As an ad for riders put it, "Wanted: Young, skinny, wiry fellows not over 18, must be expert riders, willing to risk death daily. Orphans preferred."

By the early years of Queen Victoria's reign the Mulready envelope had appeared in England, "the first prepaid postal wrapper and the grandfather of the modern envelope," Benjamin says. Soon, volume increased at a tremendous rate, and machines to make envelopes were invented. Mail service in Britain was a wonder of the world.

Handmade or not, some covers were used by both sides in the Civil War for printing incidental propaganda.

Even in the 1960s, living in London, I could mail a note in the morning from Earl's Court to a friend in Highgate and get a reply in the afternoon delivery on the same day. Benjamin explains that London has an automated subway system just for mail—trains zip letters around the city.

The French also developed a foot-powered envelope-making machine, the Rabbate, turning out more than 100 pieces an hour. The development of envelope-making machinery led to mass production; that and postal reform made postage affordable to everyone. Manufacturers still did not turn out enough envelopes, though, and many people persisted in just folding up their letters and sending them uncovered. One reason for the holdup was that the gum was still being applied by hand. Eventually drying machines, like the Arnold Drying Chain, solved that problem. Later geniuses even invented ways to vary the sizes of the envelopes in production.

During the Civil War the Confederates had trouble getting paper for envelopes, which they had always imported from the North or from England. When the blockade tightened they had to use wallpaper and book pages and other papers, all of which today are valued by collectors. Sometimes envelopes would be turned inside out for reuse. Handmade or not, some covers were used by both sides in the war for incidental propaganda, with patriotic slogans and drawings covering much of the face. Even before the war, merchants had begun putting their ads on envelopes.

Envelope decoration had a history of excess. In 1840 the British government offered a prize for the best designed prepaid envelope. William Mulready's winning design showed Britannia, the British lion and figures representing the farthest corners of the empire. With a massive Maltese-cross cancellation mark, it made an impressive collector's item, but the small blank space left for the name and address must have been a pest for the mailman to read.

Speaking of collector's items, there are many in the "Graceful Envelope" show, a result of the Postal Museum's third annual envelope-design contest. Usually the graphics and calligraphy are coordinated with certain commemorative stamps. On one envelope with the Paul Bunyan stamp, the artist has drawn a full figure of the giant to match, and attached a smaller crumpled envelope next to him. Hands out and leaning into the job, Paul is, of course, pushing the envelope.

Benjamin's book about envelopes chronicles the work of men like Ferdinand Ludwig Smithe, the Henry Ford of envelopes, and recounts the development of the Keating Adjustable Bed, the Arnold Drying Chain and the Smithe Plunger. I had no idea envelopes took so much manufacturing.

But since this is the postindustrial age, there is now available on the market a kit with which you can make your own envelopes.

I've said it before and I'll say it again: this country is moving backward, and I don't like it one bit.

It's not about how fast you get there.

Dean Witter European Growth Fund

Graph of hypothetical $10,000 investment

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*Average Annual Total Returns**	*+26.32%*	*+19.33%*	*+13.75%*
*SEC Standardized Avg. Annual Total Returns***	*+21.32%*	*+19.13%*	*+13.75%*

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Graph of hypothetical $10,000 investment

As of 6/30/97	*1 Year*	*5 Years*	*10 Years*
*Average Annual Total Returns**	*+29.29%*	*+16.93%*	*+13.49%*
*SEC Standardized Avg. Annual Total Returns***	*+24.29%*	*+16.71%*	*+13.49%*

Dean Witter Value-Added Market Series/Equity Portfolio

Graph of hypothetical $10,000 investment

As of 6/30/97	*1 Year*	*5 Years*	*Life of Fund (12/1/87)*
*Average Annual Total Returns**	*+24.71%*	*+16.96%*	*+15.67%*
*SEC Standardized Avg. Annual Total Returns***	*+19.71%*	*+16.74%*	*+15.67%*

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The graphs illustrate a hypothetical $10,000 investment through June 30, 1997, with dividends and capital gains reinvested at net asset value. For Dean Witter European Growth Fund and Dean Witter Value-Added Market Series/*Equity Portfolio*, the graphs begin at the Funds' inceptions on June 1, 1990, and December 1, 1987, respectively. For Dean Witter Dividend Growth Securities, the graph begins on June 30, 1987. The graphs do not reflect the effect of any sales charges. On July 28, 1997, the Funds introduced multiple classes of shares featuring various sales charge structures and ongoing fees. Most existing shares in the Funds were designated Class B shares, which are subject to a contingent deferred sales charge (CDSC) that starts at 5.00% and declines to zero after six years and applies only upon the sale of Fund shares. Investment return and principal will fluctuate so that your shares, when redeemed, may be worth more or less than their original purchase price. Past performance is no guarantee of future results.

*Average annual total returns reflect the actual performance of the Fund without taking sales charges into account.

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A Video Visionary

SMITHSONIAN HIGHLIGHTS

A KALEIDOSCOPE OF IMAGES FLASHES ACROSS the wall, forming a constantly changing, pulsating canvas—a visual commotion replete with iconic images from both East and West. Pictures from the Seoul Olympic Games race past a purple sunset. Scenes of traditional Korean rituals are displaced by footage of David Bowie in concert. Live video dissolves into computer-generated animation, as images of love and war are obscured by the flight of a large animated bird. Periodically the entire wall becomes the flag of Canada, Finland or Japan, underscoring the work's reliance on an amalgam of international sources.

This mesmerizing multimedia installation is the work of pioneer video artist Nam June Paik. On view at the National Museum of American Art through November 30, *Megatron/Matrix* (1995) is the Korean-born artist's most ambitious project to date. The billboard-size installation is composed of two adjoining walls of video screens—the rectangular, 150-monitor *Megatron* and the square, 65-monitor *Matrix*—all operating independently but sharing multiple random combinations of rapidly moving video and animation that transcend boundaries of time and place. The work, which is set to audio that ranges from ceremonial chants to rock and roll, is orchestrated by a complex system of laser-disk players, computers and digital sequencers. "Its grand scale and technological prowess," says NMAA chief curator Jacquelyn Days Serwer, "demonstrate Paik's extraordinary capacity to move video from the sphere of the ordinary to the limitless domain of the imagination. He has transformed television into a form of artistic expression particularly suited to our times." —*Diane M. Bolz*

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SMITHSONIAN

HIGHLIGHTS

Special October Exhibitions, Events

NATIONAL MUSEUM OF AMERICAN ART

Nam June Paik's "Megatron/Matrix" (through November 30) Ambitious installation by pioneer video artist Nam June Paik. See page 34.

Colonial Art from Puerto Rico: Selections from the Gift of Teodoro Vidal (October 3-March 8, 1998) Paintings, miniatures and sculptures by such artists as José Campeche, Felipe de Espada and Pío Casimiro Bacener.

The Paintings of Charles Burchfield (through January 25, 1998) Works by the famous watercolorist are examined in the context of the cultural and artistic environment in which he worked.

RENWICK GALLERY

Michael Lucero: Sculpture (through January 4, 1998) Show features two decades of the contemporary artist's glazed ceramic, bronze and mixed-media sculptures.

Reinstallation of the Permanent Collection Exhibition showcases 19th- and 20th-century works by nationally prominent artists in a variety of craft media.

NATIONAL PORTRAIT GALLERY

Edith Wharton's World: Portraits of People and Places (through January 25, 1998) Paintings, miniatures, photographs and literary artifacts evoke the life and milieu of novelist Edith Wharton.

Mathew Brady's Portraits: Images as History, Photography as Art (through January 4, 1998) Comprehensive exhibition features images representing all facets of the renowned photographer's work.

Breaking Racial Barriers: African Americans in the Harmon Foundation Collection (through January 4, 1998) Twenty portraits from the groundbreaking 1950s exhibition "Portraits of Outstanding Americans of Negro Origin."

NATIONAL AIR AND SPACE MUSEUM

Star Wars: The Magic of Myth (October 31-October 1998) Exhibition commemorating the 20th anniverary of the *Star Wars* trilogy will feature more than 200 original props, models, costumes and artworks. Free timed same-day tickets will be available only at the museum. Advance tickets are available starting September 1 through ProTix for a service charge of $2.25 per ticket. For information, call 202-786-2122.

Space Race Permanent installation traces the competition in space between the United States and the former Soviet Union from its origins in the 1950s to the recent international cooperation.

Mission to Mir (11:30 A.M., 1:40 and 3:50 P.M. daily) New Imax film takes viewers aboard the first permanent space station—Russia's Mir.

NATIONAL MUSEUM OF NATURAL HISTORY

Agayuliyararput (Our Way of Making Prayer): The Living Tradition of Yup'ik Masks (October 24-January 1, 1998) Exhibition from the Anchorage Museum of History and Art features masks created by Yup'ik Eskimos.

Janet Annenberg Hooker Hall of Geology, Gems and Minerals (opens at noon, September 20) New gallery showcasing the National Gem Collection takes visitors from the depths of a copper mine to the far reaches of the Solar System.

Butterfly Habitat Garden New permanent exhibition looks at butterfly behavior in four habitats: wetland, meadow, wood's edge and urban backyard.

NATIONAL ZOOLOGICAL PARK

Amazonia Permanent installation recreates a microcosm of the world's largest rain forest and river habitat.

Think Tank Permanent display explores the biology and evolution of animal thinking, focusing on orangutans.

NATIONAL MUSEUM OF AMERICAN HISTORY

Wade in the Water: African American Sacred Music Traditions (October 11-

Planning a Smithsonian Visit?

Receive a free Associates' planning packet. Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M. - 5 P.M., Monday-Friday; 10 A.M. - 4 P.M., Saturday-Sunday. *Note:* Parking near the Smithsonian is limited. The Metrorail subway is convenient to all museums (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M. - 4 P.M. daily—in the Castle. Special materials await you there. The Court dining room and all other eating facilities in the National Museum of Natural History are closed. Associates may receive a discount at the National Air and Space Museum's Wright Place restaurant, open 11:30 A.M. - 3 P.M. daily.

Smithsonian museums are generally open 10 A.M. - 5:30 P.M. daily, except December 25. Hours at the National Zoo are 10 A.M. - 4:30 P.M. daily for buildings, 6 A.M. - 6 P.M. for grounds.

SMITHSONIAN WEBSITE

The Smithsonian home page on the World Wide Web (www.si.edu) offers on-line information about exhibitions, collections, events and products.

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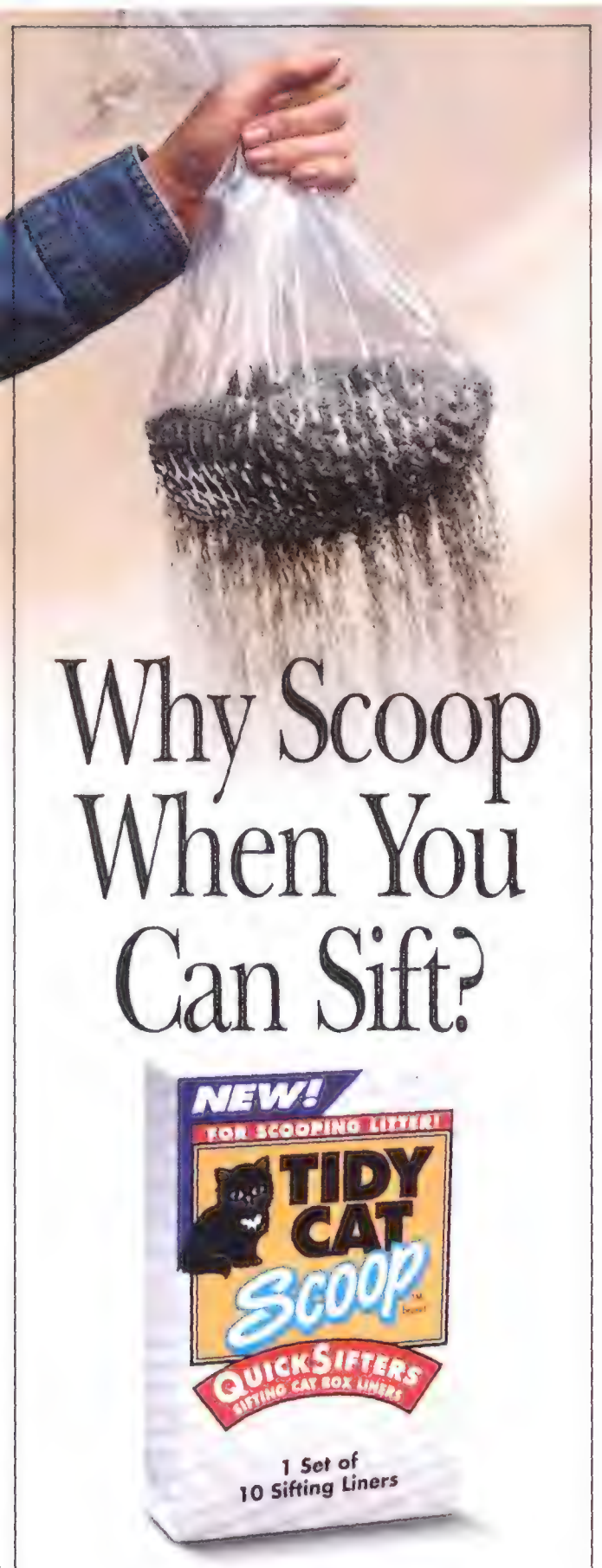

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December 7) Exhibition circulated by SITES traces the growth of this genre from its roots in slavery to its interpretation in today's black churches.
Guitars from the Scott Chinery Collection (through October 24) Vintage guitars built between 1852 and 1980.
Jackie Robinson and the Integration of Major League Baseball (through early November 1997) Showcase display explores Robinson's career and its historical significance in spawning racial integration in American sports.
First Ladies: Political Role and Public Image Permanent exhibition takes a look at the evolving roles of our nation's First Ladies.

NATIONAL POSTAL MUSEUM
[NEAR UNION STATION ON CAPITOL HILL]

A Far Distant Land: Letters from the Mexican War (October 5-May 1998) Letters from Lieut. William McKean to his family in Arkansas describe his experiences in the Mexican War (1847-48).
Undercover: The Evolution of the American Envelope (runs indefinitely) Exhibition examines the evolution of envelope manufacturing in the mid-1900s.
See page 30.

FREER GALLERY OF ART

An Invitation to Tea (through May 1998) Objects from Japan, Korea, China, Turkey and Vietnam focus on the centuries-old Japanese tea ceremony.
Shades of Green and Blue: Chinese Celadon Ceramics (runs indefinitely) Exhibition of Chinese ceramics examines the development of the gray-green glaze known in the West as celadon.
At the Margins (runs indefinitely) Show explores the style of asymmetrical border embellishment used in Mughal Indian painting between the 16th and 19th centuries.

ARTHUR M. SACKLER GALLERY

The Jewel and the Rose: Art for Shah-Jahan (through February 1998) Paintings, textiles and objects illustrate the splendor of Indian artistic expression during the reign (1627-58) of Shah-Jahan.

Edith Wharton show at the National Portrait Gallery features a portrait by Edward Harrison May of the author in 1881, at age 19.

Puja: Expressions of Hindu Devotion (runs indefinitely) Exhibition features objects made in India between the 9th and 20th centuries for *puja*, an act of personal devotion to a deity.

NATIONAL MUSEUM OF AFRICAN ART

The Poetics of Line: Seven Artists of the Nsukka Group, Nigeria (October 22-April 26, 1998) The work of a group of artists who studied or taught in the Department of Fine and Applied Arts at the University of Nigeria, Nsukka.
Treasures from Tervuren: Selections from the Belgian Royal Museum for Central Africa (through October 19) Objects from the world's greatest collection of Central African art.
Gifts to the National Collection of African Art (through March 4, 1998) Show honors the collection-building legacy of former director Sylvia H. Williams.

HIRSHHORN MUSEUM & SCULPTURE GARDEN

Stanley Spencer: An English Vision (October 9-January 4, 1998) Landscapes, still lifes, nudes, genre scenes, portraits, allegories and social narratives repre-

sent the 20th-century British artist's independent, eccentric vision.
Directions—Louise Lawler\"Monochrome" (through October 19) First solo exhibition in Washington for the New York-based conceptual artist.

ARTS AND INDUSTRIES BUILDING

Stories of the People (through January 25, 1998) Objects representing six American Indian cultures were drawn from the collection of the National Museum of the American Indian.
Posy Holders Permanent display of one-of-a-kind posy holders made of precious metals and semiprecious stones.
Discovery Theater Live theater for young audiences. For information, showtimes and ticket prices, call 202-357-1500 (voice or TTY) weekdays, 9 A.M.-4 P.M.

THE CASTLE—INFORMATION CENTER

Smithson's Gift Permanent exhibit tells the story of the British scientist whose bequest founded the Smithsonian.

INTERNATIONAL GALLERY, S. DILLON RIPLEY CENTER

Seeing Jazz (October 30-January 19, 1998) SITES exhibition presents a panorama of artistic responses to jazz by such greats as Romare Bearden, Sam Gilliam, Toni Morrison and others.

ANACOSTIA MUSEUM

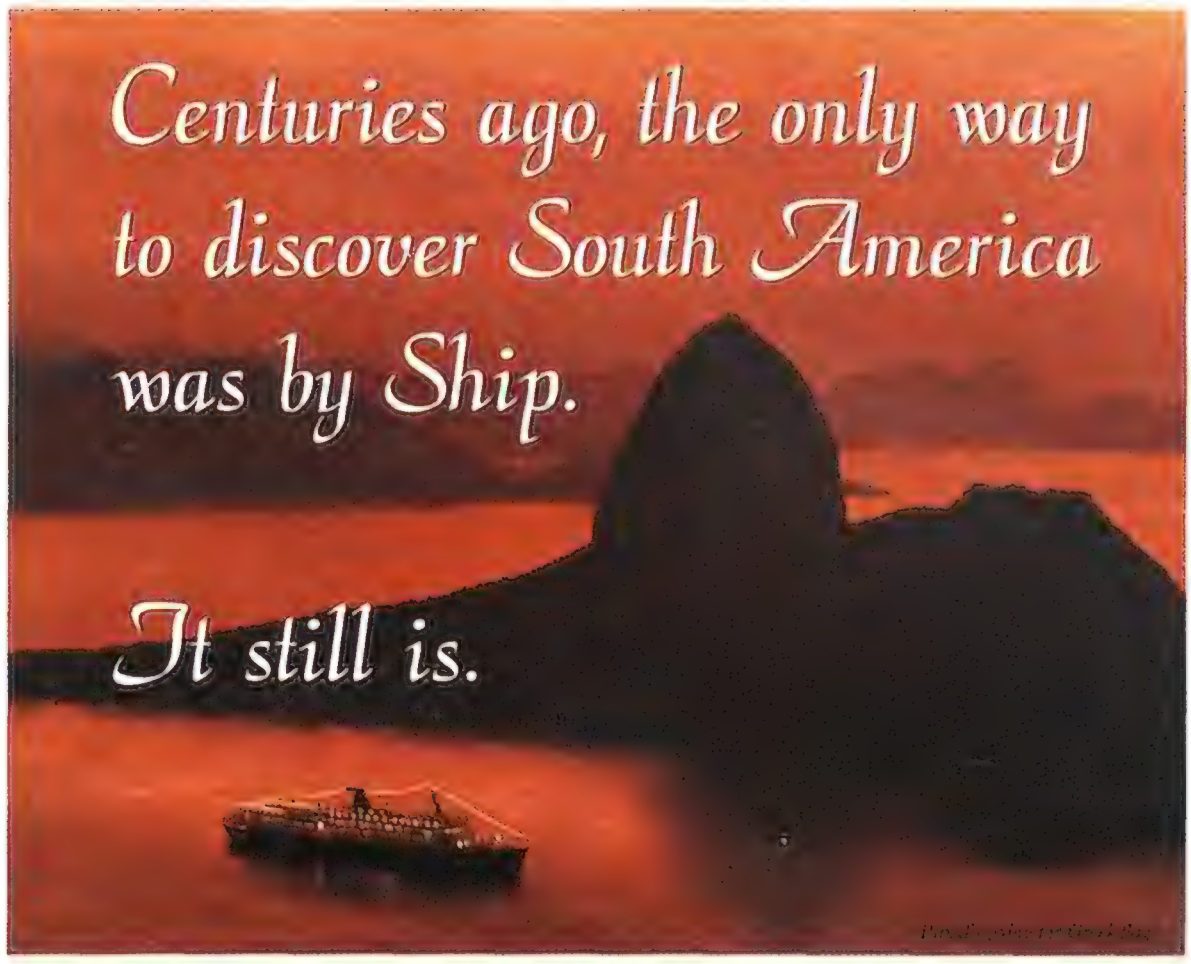
Museum Renovation The museum is closed until the late fall of 1997.

HEYE CENTER, NATIONAL MUSEUM OF THE AMERICAN INDIAN
[NEW YORK CITY]

To Honor and Comfort: Native Quilting Traditions (October 19-January 4, 1998) Exhibition of quilts demonstrates the cultural and economic significance of quilt-making in tribal communities.

COOPER-HEWITT, NATIONAL DESIGN MUSEUM
[NEW YORK CITY]

Design for Life: A Centennial Celebration (through January 4, 1998) Show exam-



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SPECIAL ANNOUNCEMENT

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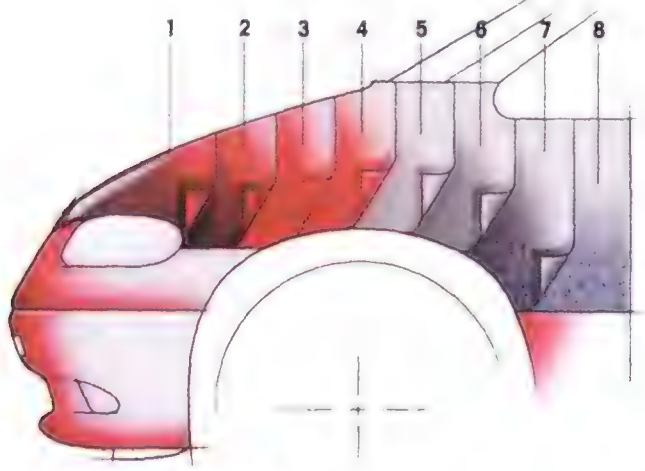

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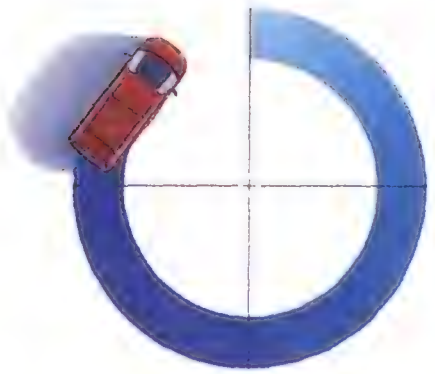

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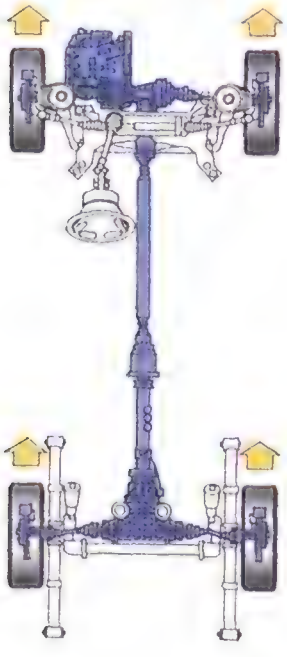

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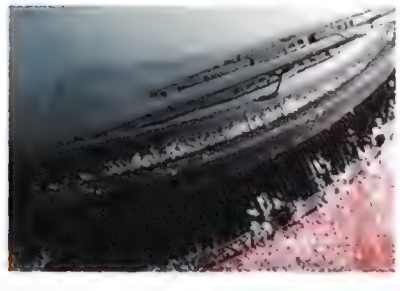

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BY JIM DOHERTY ❦ PHOTOGRAPHS BY RICHARD HOWARD

IN DOWN EAST MAINE, THE LOBSTER MEANS MORE THAN SEAFOOD

YESTERDAY I STOOD ON THE wharf at the lobstermen's co-op in Corea, Maine (pop. 507), and watched the boats come in. One after another they rumbled into the harbor and nudged up alongside the floating dock to unload their catches and take on fuel and bait. There were big boats and little boats, green and white and yellow boats, old boats and new boats, and they all had names on their sterns—*Laverna Gail*, *Killing Time*, *Contention*, *Riff Raff*, *Ol' Grizz*, *Just N Case*. Most were manned by solitary individuals who bantered with the co-op manager and his two assistants as they wrestled crates full of lobsters and buckets full of bait. Several had helpers, called sternmen, who made themselves useful and joined in the gossip and kidding.

Today it's my turn to be the sternman aboard one of those boats, a 38-footer called *Sally Ann*. The sturdy craft is named after the wife of its owner, Harvey Crowley, a barrel-chested man in blaze-orange overalls who, having agreed to take me on, is telling me what to do as we make the rounds of his traps. The job consists mainly, it turns out, of filling bait bags and banding the claws of the lobsters Harvey brings up.

It occurs to me more than once as I go about my tasks that, if you are not independently wealthy and have to work for a living, you could do a whole lot worse than this. The salty air is invigorating, the Maine coast is achingly beautiful and the mewing of gulls is balm to the soul. There are only a couple of drawbacks. One is the possibility that I could be yanked overboard if my leg becomes entangled in the uncoiling rope of a rapidly descending trap. The other is the malodorous tub of ripe bait fish that serves as my duty station here in the *Sally Ann*'s cramped pilothouse.

Left: Bands prevent freshly caught lobsters from injuring each other. Above: Harvey Crowley returns an emptied trap to the brine.

Biologists inform us that the American lobster, *Homarus americanus*, which ranges from the Carolinas to Newfoundland, is not a picky eater. It dines on mollusks, crustaceans (including other lobsters) and fish, dead or alive. Most lobstermen bait their traps with salted fish parts because the rank stuff is available in bulk and easy to use. This is what I'm scooping out of the tub, fistful by juicy fistful, and stuffing into grapefruit-size bags made of polypropylene mesh, each with a drawstring at the top. After I've filled a bag and yanked the drawstring tight, I lean it against the edge of the tub where Harvey can grab it.

A BONA FIDE LOBSTER ENRICHMENT PROGRAM

EVERYONE KNOWS THE LOBSTERMAN takes food out of the ocean, but few realize how much he puts back in. These days, more than two million lobster traps are distributed throughout Maine's chilly waters, from Kittery and Portland in the west to Jonesport and Cutler Down East. The bottoms of many harbors are so cluttered with them that a poor lobster can hardly go for a walk without bumping into one. Each of those two million traps contains a few pounds of bait that must be replenished every one to three days. Over the course of a season, that adds up to a lot of nourishment—about 40,000 tons of it, in all.

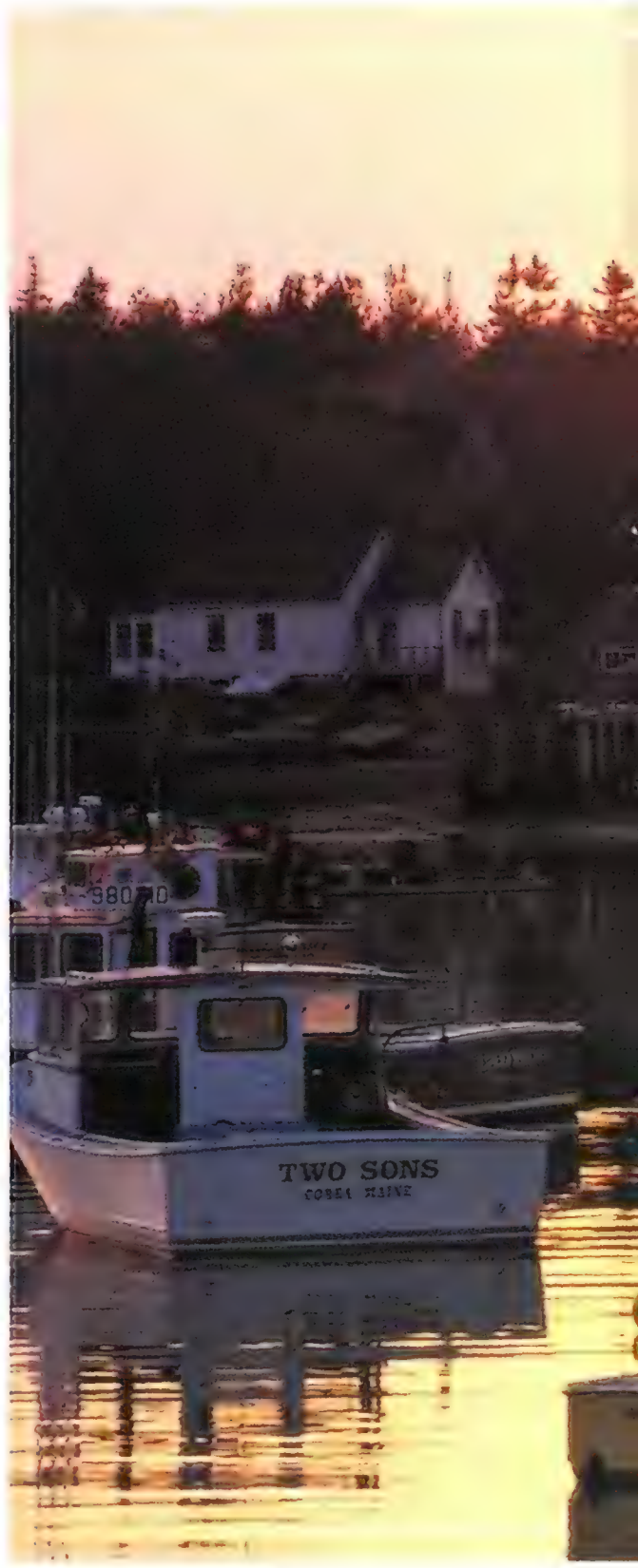
The beneficiaries are not limited to the target species, as anyone who has ever emptied a lobster trap can attest. Crabs, sea urchins, whelks, starfish, sculpins, sea fleas and a ravenous horde of other freeloaders drop in at all hours of the day and night to help themselves. But if the trap system is primitive and inefficient, it nevertheless serves its purpose. Enough lobsters of legal size take the bait to appease the appetites of millions of *Homarus*-lovers all over the country and to provide a significant income for many if not most of Maine's 7,362 registered lobstermen.

Why, then, is my man Harvey Crowley—husband, father, grandfather, memoirist, landscape painter, president of the Corea Lobster Co-op, president of the Downeast Lobstermen's Association—singing the blues this morning? Well, because lobstermen are overregulated, overcapitalized and overworked, that's why. Because, Harvey grumbles, "bug hunters" (by which he means scientists) and "fishcrats" (by which he means bureaucrats) think they know more about lobsters than do lobstermen who spend their entire lives on the water. Because people from Massachusetts and New York are gobbling up property in Corea and other fishing villages all up and down the coast, making it harder and harder for working lobstermen to get to the water. Those are a few of the reasons.

Harvey is straining to make himself heard over the rasping of a trapline on the drum of the *Sally Ann*'s hydraulic winch. "I'll tell you a story, Jim!" he bellows. "Lobstering used to be fun! But all the fun has gone out of it, Jim! It's right discouraging, that's what it is!"

The discouragement is not new. It began back in the late 1960s, when lobstermen were putting out more and more traps but bringing in fewer and fewer lobsters. Some scientists said it was because they were overexploiting the resource. Since then, the number of traps in use has more than tripled. Biologists continue to fret about overfishing, but guess what? Lobstermen are hauling in record catches and near-record catches year after year.

For many veterans like Harvey Crowley, the good news only confirms the bad: the so-called experts who advocate the imposition of stiffer controls on lobstermen don't know what they're talking about. "They got a law passed here in 1995 that limits the number of traps a man can haul," Harvey says, taking a lobster out of a trap, measuring it with his gauge and handing it to me. "They've been talking for years about restricting the number of people who can go into lobstering," he continues, rebaiting the trap and shoving it overboard. Harvey has a deep voice that sometimes breaks unexpectedly into a warbling falsetto when he's expressing heartfelt indignation. "And now they want to tell us when we can fish and where we can fish, to boot," he warbles, throttling up the engine and heading for the next black-and-white buoy. "Well it's not right, Jim, and I'm going to fight it."



Once upon a time, before there was

The picturesque harbor in Corea, Maine, looks much the same as it did 50 years ago, but most homes on the water are no longer owned by lobstermen.

a Lobster Club restaurant in New York City, a Lobster Pot restaurant in Provincetown, Massachusetts, and a Red Lobster seafood chain all across the country; before there were roadside stands peddling lobster rolls in Maine and tanks displaying live lobsters in supermarkets everywhere you go; before there was an alternative-music band in Minnesota called Lobster Boy and an off-Broadway play in Manhattan called *The Lobster Reef*; before lobsters began showing up on license plates, shirts, hats, coffee mugs and other souvenirs; before the actress Mary Tyler Moore offered to pay a restaurant a "ransom" of $1,000 if it would liberate a 12½-pound, 65-year-old lobster it was holding captive; before humorist Dave Barry declared that he could see no difference between the lobster and the giant Madagascar hissing cockroach; before, in short, *Homarus* became a wildly popular luxury food, an icon and the subject of numerous controversies, there were a *helluva* lot of lobsters around. Tens of millions. Who knows—maybe even billions. So many, in any case, that you would have had a hard time convincing New England's settlers that future generations of Americans might actually worry about running short.

They had lobsters coming out of their ears in those days. The goofy-looking critters could be plucked from tidal pools and gaffed by the dozens in shallow waters. After storms they were found washed ashore in great heaps that organic gardeners (everybody was an organic gardener, back then) pitchforked into wagons, hauled away and used for fertilizer. Bunyanesque individuals weighing more than 40 pounds were unremarkable, as were stories

about monsters five and six feet long.

With its 4,568 miles of coastline and thousands of near-shore islands, Maine was ideally suited for lobstering which, by the mid-1800s, had become a major industry there. The typical lobsterman, however, was content to operate pretty much as a part-timer. He had plenty of other things to do.

Famously self-reliant, the inhabitants of coastal Maine farmed and gardened, hunted, fished for halibut and cod, collected oysters and crabs, dug clams, cut trees for lumber and fuel. They went lobstering mainly in the spring and fall, usually tending no more than a few dozen traps near shore in rowboats or small sailing craft. They made their own gear. They didn't owe anybody anything. If a lobsterman didn't feel like hauling, he stayed home. "Take a tuck in my gumption, Junior," he might tell a friend, "them lobsters are on t'me. Let 'em wait a day."

BIGGER BOATS BROUGHT IN BIGGER HAULS

THE 1940S AND '50S WERE A TIME OF transition. The demand for lobsters soared, and servicemen returning from World War II had no trouble financing the purchase of gear and a boat. By then, the lobster boat was evolving into a highly specialized vessel with a powerful inboard engine, a cabin, a hydraulic hauler and fancy gadgets like radar and a depth sounder that would make it possible to fish more traps in less time. In 1951, Maine lobstermen hauled nearly 400,000 traps to catch 20 million pounds annually. That was roughly twice the number of traps fished a decade earlier.

Lobstering was still pretty low-key in Corea when the writer Louise Dickinson Rich began living there in the mid-1950s. "It was just a little harbor, a scooped-out basin in the pink granite, surrounded by high-posted wharfs, each with its shack for gear, and by the unpretentious houses of the region."

The description is from *The Peninsula*, an evocative book Rich wrote about Corea and its environs. In those days the tiny Down East hamlet, situated at the eastern end of the Gouldsboro Peninsula, consisted of several dozen families. There were only a few stray summer people. Of the 30 or so boats moored in the harbor, not one was a pleasure craft. Every man in town held a lobster-fishing license, with four exceptions; three were retired lobstermen.

Many of Corea's children were born in, and many of its older folks died in, their own homes. Some of those homes had running water, but many did not. Washing machines, vacuum cleaners and the like were luxuries. There were three lobster buyers in town; the present-day co-op was run privately by a genial fellow nicknamed Twink. There was just one store, and it shared space with the post office. Both were run by Herb Young, the fourth of the exceptions noted above.

A Corea lobsterman might run 150 to 200 traps, which he made himself out of wood. Buoys, too, were handmade and painted in the owner's distinctive colors, often by his children. You could buy a lobster boat back then for around $4,000.

Rich's pithy characters were loners, like lobstermen everywhere, but whenever someone was in need, they responded. On one bright July afternoon, the entire community turned out to attend a memorial service for a man named Raymond Dunbar, who had disappeared while fishing alone. The service was held in the white church on the hillside that overlooks the harbor. "There were none of the grimaces of easy grief upon the rugged faces. . . . Only when Raymond's family . . . took their places did a small sound, more like a sigh than a murmur, sweep the assemblage."

The circumstances that enabled the residents of Corea and many other fishing towns to, as Rich put it, "live lives of more than surface contentment" were changing. To cover their increasing overhead and expenses, more and more lobstermen had to work full-time most of the year. They started fishing farther, deeper and more intensively than ever before. They were catching lobsters, yes, but they were losing something, too. They were losing their go-to-hell independence.

In the early 1970s, the bottom dropped out—or so it seemed. Despite the huge increase in fishing effort, the overall catch went into a tailspin. State experts attributed it to cooling water temperatures, about which they could do nothing, and to overfishing, about which they wanted to do a great deal.

Maine had a number of lobster-conservation laws on the books, including a prohibition against taking reproductive females, but Robert Dow, the crusty longtime director of research in the state's marine fisheries department, didn't think they were enough. He advocated a significant increase in the minimum size limit, because, as a biol-

Retired lobsterman Herman Anderson knits bait bags for local customers in the shed near his Corea home. Right: Wire traps and Styrofoam buoys crowd a wharf.

ogist, he believed the best way to produce more lobsters was to enable more females to reach sexual maturity. He also wanted to eliminate the maximum size limit, which made no sense to him as a conservation measure. Finally, he believed it was essential to limit numbers of traps and fishermen.

Lobstermen, inherently suspicious of government officials and other overeducated individuals to begin with, had a predictable reaction to Dow's ideas. They hated them. Increasing the minimum size, they said, would reduce their catch and drive them out of business. They didn't want anyone telling them how many traps they could haul. As for putting a cap on lobstering licenses—"limited entry," it was called—whoever heard of such nonsense?

One of the many things about which scientists and lobstermen disagreed was the lobster itself. Lobstermen insisted that lobsters "migrate"; a number of early scientific studies indicated otherwise, though more recent research has confirmed that a certain amount of seasonal movement does take place. Lobstermen said lobsters didn't eat urchins; scientists said they did. Lobstermen were convinced that the big ones living in deep offshore waters constituted Maine's primary "brood stock"; scientists once derided the notion but now believe there is some truth to it.

Something else that added to the confusion over the years becomes obvious to me while I'm carrying out my duties here on the *Sally Ann*: all lobsters are not alike. It's not just that they vary somewhat in coloration, size and shape; they behave differently, too. Some are wimps who submit without resistance to banding, which is necessary to prevent them from tearing each other apart with their claws, whereas others are warriors.

Take this feisty two-pounder I'm holding in my hand. First it grabbed several bands in its big crusher claw and refused to relinquish them. Now it's flailing the same claw about so wildly I can't even begin to slip a band over it with these weird rubber-band pliers which, let's face it, take some getting used to. At Harvey's suggestion, I grasp the creature higher up.

Just as I get the claw under control, the band slips off the pliers and zings into the bait tub. Then somehow I end up with a piece of my sleeve snagged in a pincer. "Don't get your finger caught in there or you'll wish you hadn't," Harvey cautions.

Enough. This lobster is making a monkey out of me. I wrench my sleeve free, steady the claw between my thumb and index finger, slip on the band and triumphantly drop the troublemaker into the barrel with the others. *Hasta la vista*, baby.

By the mid-1980s, many lobstermen—particularly in the populous western

The well-known Maine photographer George French took this picture of an unidentified lobsterman in the 1940s, when boats were small and traps were made of wood.

section of the coast—had begun to have second thoughts about regulatory reforms. They knew there were too many traps in the water; they had to pick their way through them every day. They also knew there were too many lobstermen. Full-timers complained about part-timers, old-timers criticized newcomers, small operators who hauled 300 or 400 traps resented the big ones who hauled upwards of 1,000.

Eventually the Maine Lobstermen's Association (MLA), the largest and most influential trade organization, came out in favor of limited entry, license fee increases and an apprenticeship program. But that didn't sit well with many lobstermen Down East. They didn't share the westerners' concerns about congestion and overfishing. They did not wish to pay higher fees. Trap limits and limited entry remained as repugnant as ever to them. And so, feeling as they did, they started up their own organization, which they called the Downeast Lobstermen's Association (DELA) and which has, ever since, adamantly opposed many of the measures that the MLA and the state have backed.

Hardly anyone is happy with the relatively few adjustments Maine lawmakers have made in recent years, including a slight increase in the minimum size and the imposition of a 1,200-per-person trap limit. Scientists say the minimum size is still too small, and nearly everyone agrees that the trap limit is much too high. "The whole situation has become so politically engulfed that you can't even talk about limited entry anymore," says Jay Krouse, Dow's successor as the state's lobster biologist.

Two decades ago, when some scientists were warning of a "collapse," Maine's annual catch was down to 18.5 million pounds. During the past several years, it has held steady at around 35 million pounds. Obvious question: If the resource is overfished, how come it's yielding such huge landings?

Krouse offers several explanations, including rising water temperatures (lobsters are more active and grow faster in warmer water) and better reproduction due to the increased minimum size. Not to be overlooked, he adds, is the "handout" factor—that tremendous load of salted sardines, mackerel and God knows what else that lobstermen dump overboard each year as bait. In effect, Krouse says, each of those two million-plus traps is a Pizza Hut for any lobster small enough to swim in, gorge itself silly and swim out.

Whatever the reasons for the upsurge, it does not help Krouse and like-minded scientists make their case, which basically is the same case Robert Dow attempted to make. But they keep trying. "You have to remember that in spite of the high yields there's one thing that hasn't changed," Krouse says. "Year in and year out, most of the lobsters we harvest have just reached the minimum legal size. That means we're nearly wiping out an entire generation every year. There will be a very long recovery time if we finally succeed in pushing this resource over the brink."

Maine accounts for about half of the nation's lobster catch. The six states that haul the other half have, together with Maine, asked the Atlantic States Marine Fisheries Commission, a regional oversight board, to do what they themselves have thus far been unable to do—come up with a plan to control lobstering pressure that applies to all state-controlled waters. A parallel effort is under way to develop new restrictions in federal waters.

WHO WILL DO THE RIGHT THING?

WHAT'S AT STAKE IN MAINE IS NOT just lobsters but the lobstering way of life—or what's left of it. Town after town and village after village has been tidied up and transformed into something a tourist might like. Prime waterfront property is occupied by retirees, vacationers and other CFAs, as the natives refer to people who Come From Away. The lobstermen live in the woods, often miles from where their boats are anchored. Selling the family home in town was for many the only way to stay in business, or get into it.

It's a given in Maine today that you need upwards of $200,000 to start out in lobstering—$100,000 for a good used boat, $40,000 for gear, $50,000 for a trailer home (and a place to put it) and

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maybe $10,000 for a used pickup truck. In the old days, you didn't jump in all at once; you started small and paid your own way as you grew. You knew how to keep a dollar in your pocket. But these aren't the old days.

Take Corea, for example. It's as beautiful as ever it was—maybe even more so. The houses are nicely landscaped and painted, and there are more of them; some even have picket fences. The yards aren't cluttered with traps, buoys and other gear, the way they used to be. The co-op is the only place in town that buys and sells lobsters. Herb Young's store has long since gone out of business.

NOW THEY ARE THE LAST OF THE NATIVES

ONE OF THE FEW WORKING LOBSTERmen who still live on the harbor is 81-year-old Raymond Dunbar, Jr., the son of the man who disappeared 41 years ago. Dunbar resides near the co-op with his wife, Nat, in the house that once belonged to his grandfather. The houses the Dunbars grew up in are located directly across the water. Nat can see both places from her customary vantage point next to the kitchen window, where she keeps an eye on the local goings-on with the assistance of her binoculars.

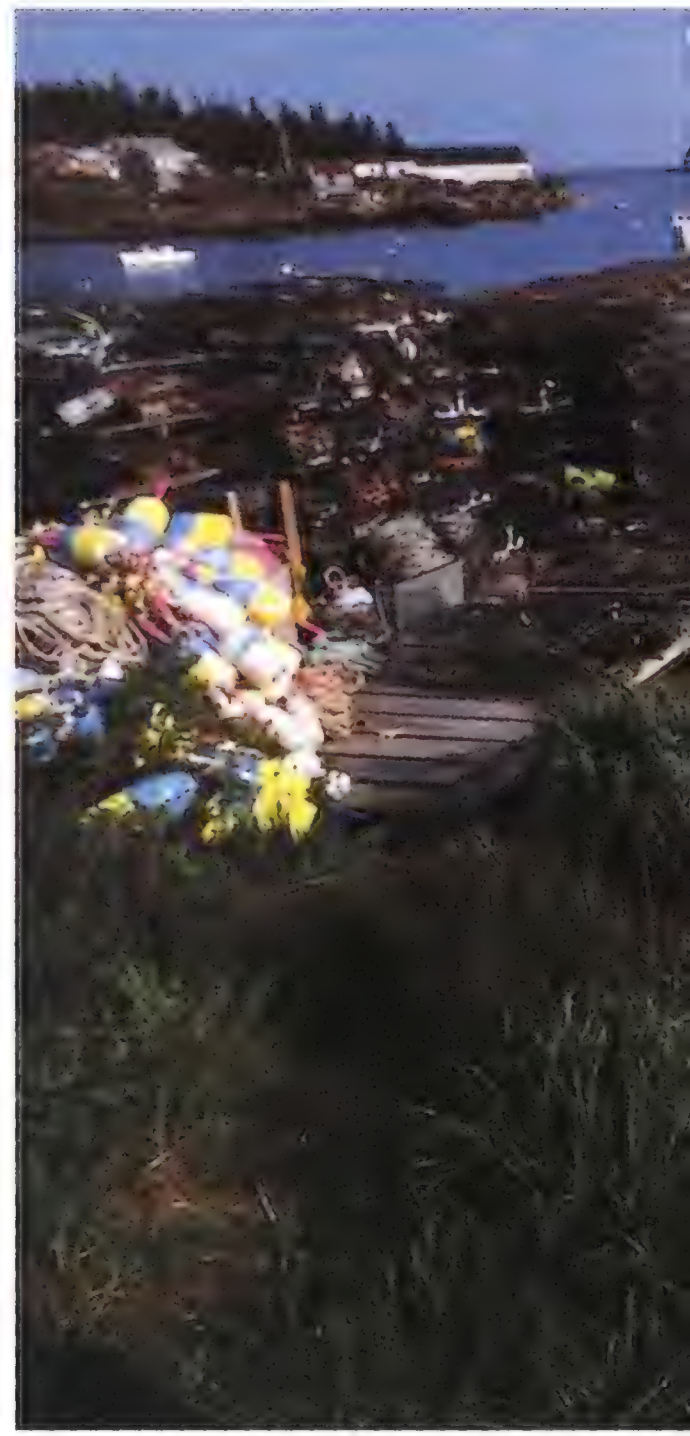
"We used to know everyone who lived in every house," she tells me when I stop by to chat one afternoon. "Now only a few natives are left. Pretty soon this won't even be a fishing village anymore." There has been tension between old-timers and newcomers. "One of them used to call the town manager at 5 in the morning to complain that the sound of the lobster boats going out woke her up," Raymond says, shaking his head in disbelief.

The Dunbars' two sons are lobstermen, and Raymond and Nat worry that their "boys" are under too much pressure. "Gory, I used to figure if I made $25 in a day, that was the week's groceries," Raymond says. "Now they're not content with $250 or $300." "They want instant wealth," Nat chimes in. "But you know what? I don't think they're as happy as we were."

Harvey Crowley lives out on Cranberry Point Road, past the Young Brothers boatyard and about a mile from the secluded oceanfront cabin once occupied by Louise Rich. The wharf at the harbor where he parks his truck and keeps his dinghy is just minutes away. At 64, Harvey plans to cut back some, but he still keeps 550 traps in the water and has plenty of extra work to do as the DELA president.

Last year, lawmakers in Augusta took a significant step toward decentralizing lobster management. They divided the entire coast into zones and authorized local councils, made up of lobstermen and legislators, to vote on things like trap limits and harvest times. Mike Brown, a prominent Maine writer and lobsterman, damns the plan as a "grand sham" that Balkanizes the coast. A state marine fisheries scientist calls it "a case of putting the fox in charge of the chicken coop." But the MLA is for it and so is Harvey. "It gives the lobsterman some say," he explains. "It allows for regional differences." But zoning does nothing to alleviate lingering concerns Down East about limited entry, which some scientists continue to regard as essential. "There are no jobs for young people around here," Harvey says. "Anyone who was born Down East and wants to stay here should be able to go into lobstering, the way I did, but limited entry would make that impossible. A license could be worth $100,000 or more. Add that on top of what it already costs to start out and no youngster could break in unless he was rich or worked for one of the big corporations that inevitably would take over."

Growing up on Beal's Island, near Jonesport, Harvey never questioned what he was going to do for a living.



When he was a baby, his parents put him in a cardboard carton and took him out hauling. When he was older, he and his playmates pulled their toy boats on the tidal flats, setting out miniature traps and pretending periwinkles were lobsters. Older still, he started going out with his mother in a rowboat to haul real traps, and pretty soon he owned a skiff with an outboard motor. He was on his way.

Now he's one of the old-timers, singing the blues. And the thing that bothers him more than anything else is the lack of respect scientists, bureaucrats and politicians have for what he calls "the inborn essence" of lobstering. "It's something you have a feeling for," he says, touching his chest. "When you start hauling in the spring, where

Raymond and Nat Dunbar grew up in Corea and raised two sons there. His grandfather and father were lobstermen, and the Dunbars' "boys" are carrying on the tradition.

you set your traps, when you move 'em, where you move 'em—you have to know your bottom and what's going on down there."

If lobstering isn't as much fun as it used to be, there must be some other reason why so many people want to do it. Actually, there are two. The working conditions aren't half bad, as I discovered for myself, and the money is pretty good. The typical full-timer operating out of Corea clears $40,000 or $50,000 a year hauling 500 or 600 traps, and there's more to be made catching tuna and diving for urchins.

For Harvey, it comes down to this: after all these years, he still loves to go fishing. He's a man to whom the routine of getting into a dinghy at 5 A.M., paddling to his boat and clambering aboard has long since become second nature. He plunks his blue-and-white cooler, containing lunch, a snack and several Cokes, onto the bulkhead in the *Sally Ann*'s pilothouse, starts the engine (*thrum! thrum!*) and, while it's warming up, steps into his overalls and pours himself a cup of coffee out of his thermos. Then he flips on the CB radio and casts off.

Once we clear the mouth of the harbor, Harvey bears right toward Cranberry Point and the waters beyond. The morning is gray and calm, and fog starts rolling in as we work one group of traps, then another and another. We don't see many other boats, but we can tell from the chitchat on the radio that they're all around us. The Dunbars' youngest son, Greg, who is nicknamed Fat Albert because he's so skinny, is a major presence. His youthful voice provides a running commentary, of sorts, as he hauls his traps. He takes a lot of ribbing from the others. "Hey, did you see that movie on the TV last night?" (No, Albert.) "I heard Billy has a new girlfriend." (What happened to the old one, Albert?) "Boy, it's gettin' right soupy out here." (Whaddya know, Albert just noticed it's foggy outside.)

Harvey's wife, Sally, checks in. "How's the new sternman doing?" Harvey responds laconically: "Oh, not too bad. Wants seasoning, though." Sally says: "Danie has a tennis lesson at 3:30. Can you take her over?" Danie is their 13-year-old daughter, Danielle. Harvey says: "Yes, love, I'll see to it."

The day is done before I know it. Harvey is a steady worker, but between hauls he has been able to tell me how he feels about a great many things, and now it's time to go home. We head back with a barrel full of lobsters, rumble into the harbor and nudge up alongside the co-op.

The manager and one of his helpers, a wiry fellow with close-cropped gray hair and a mouth as straight as the edge of a ruler, amuse themselves by giving Harvey a hard time before they unload and weigh his lobsters. The helper wants to know if there's any soda on board. Harvey nods at a can of Coke in the pilothouse. "Well hand it over then, dammit, and don't shake it up none, either."

Harvey does his best to look aggrieved. "They abuse me something awful, don't they Jim?" he warbles. Then, out of the side of his mouth: "Well, that's the way it ought to be. I like it when they give me a hard time, I really do." He fetches the Coke, gives it a dozen hard shakes and tosses it to his grinning tormentor.

Jim Doherty is a SMITHSONIAN *editor. Richard Howard is an avid saltwater fisherman who spends a lot of time in Maine.*

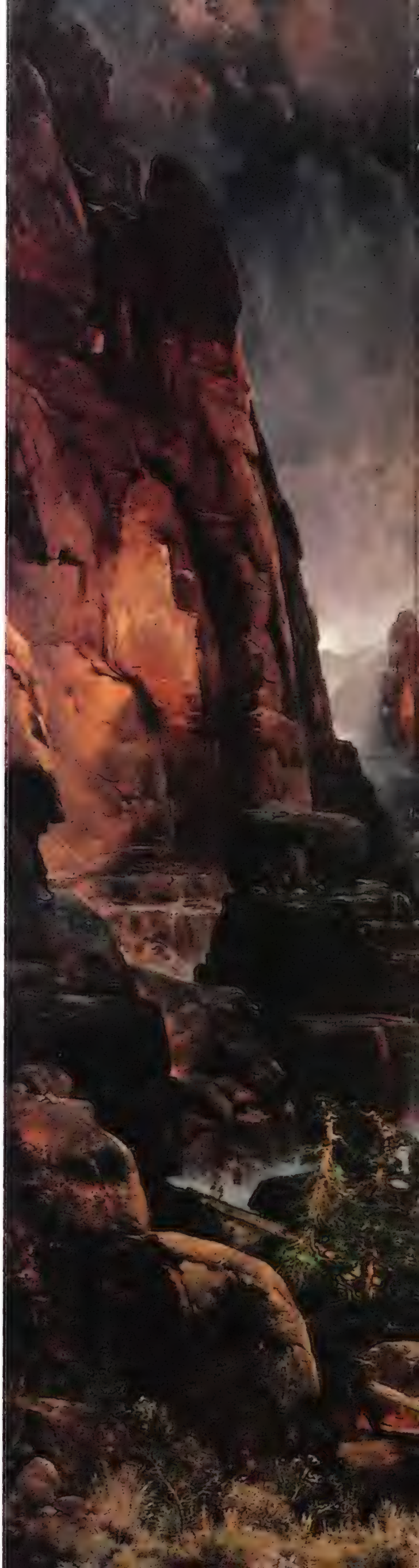
Go West, MORAN

A LIFETIME OF PAINTING THE COUNTRY'S NATURAL TREASURES WAS THIS TENDERFOOT'S DESTINY

BY DONALD DALE JACKSON

THE MAN WHO STEPPED OFF THE STAGECOACH in the mining town of Virginia City, Montana Territory, in July 1871 was easily identifiable as a greenhorn. Thomas Moran, gaunt and heavy-bearded, a 34-year-old journeyman landscape painter from Philadelphia, was making his first trip West only two years after the golden spike had opened coast-to-coast rail travel in the United States.

He was a quiet, reserved man, more comfortable in a three-piece suit than flannels and buckskin. He was just over 5 feet 9 but looked taller because he was so lean as to appear cadaverous, with blue-gray eyes that shone with curiosity. The prospectors in played-out Virginia City were no doubt curious about him, but the mystery soon vanished when he reported with his carpetbag to the nearby encampment of the party he was joining. Moran was to accompany the United States Geological and Geographical Survey of the Ter-



Chasm of the Colorado, Thomas Moran's splendid 12-foot-wide panorama of the Grand Canyon, is in a National Gallery show.

Feeding romantic nostalgia back East, Moran painted Indians along Wyoming's Green River where a railroad town actually stood.

MORAN. 1881

ritories, known as the Hayden Survey for its leader, Ferdinand V. Hayden, on the first official exploration of the area that soon would become Yellowstone National Park.

A naturalized immigrant born in England, and a man just edging into his prime as an artist, Moran was about to become the painter whose gifts would introduce Americans to many of the most spectacular landscapes of the West—first Yellowstone, later the Grand Canyon in Arizona, Zion Canyon in Utah, the Tetons in Wyoming, and more. His grand Western canvases are centerpieces in the first Moran retrospective exhibition, which opened September 28 at the National Gallery of Art in Washington, D.C. The exhibition, which is sponsored in Washington by Boeing, will run here through January 11, 1998, and then travel to the Gilcrease Museum in Tulsa from February 8 through May 10, and the Seattle Art Museum from June 11 through August 30.

Through his paintings, Moran helped define, forever, the way Americans see and think about the wonders of our West. But on the dusty summer day he met geologist Hayden and his veteran explorers, he was still a little-known Eastern painter and a rookie in the Big Country. With his family, he had emigrated to America at age 7 from Bolton, a grimy textile center where his parents had labored as weavers. Precociously talented, young Tom was apprenticed to an engraver in Philadelphia and then launched a career as a landscape painter before he had cleared his teens. He had returned to England to study the work of the great British landscapist J.M.W. Turner and had begun to sell his own oils at respectable prices. He married Mary Nimmo, a Scottish immigrant, in 1863.

"The business of a great painter should be the representation of great scenes in nature."

Moran's watercolors of the Yellowstone River country—here, the upper falls—helped convince Congress to establish the first national park in 1872.

The chance to go West had arisen through a rare convergence of government, business, science and art, all of which stood to gain from an expedition to the Yellowstone country and from the national park—America's first—that was created immediately afterward. The government needed information about the area's resources and potential for development. The business interest was railroads, particularly the Northern Pacific, which saw the possibility of lucrative tourist travel to the region. It was a Northern Pacific representative who arranged for Moran to accompany Hayden; and to help with his expenses, Jay Cooke, the line's financier, had advanced him $500 against paintings he would later produce.

Nancy Anderson, curator of the exhibition at the National Gallery and author of its catalog, calls the creation of Yellowstone Park "an integration of interests that often mix like oil and water, because they all had something to gain. For artists it was a chance to see this prime place and to sell paintings of it, which Moran did."

With the artist astride a horse for the first time in his life, Hayden and his men rode out from Virginia City to Fort Ellis, near Bozeman, where they acquired a military escort before heading for the Yellowstone Valley. Moran noted in his journal that this was his first experience sleeping "out in the open air." Riding, made tortuous by his bony frame, was eased somewhat by a pillow on his saddle. But he was, above all, game. William H. Jackson, the celebrated photographer of the West who was in the Hayden party (and whose photographs of Yellowstone are displayed alongside Moran's paintings in the National Gallery exhibition), described the artist as "keenly enthusiastic" and noted that "none was more untiring on the trail or less mindful of unaccustomed food or hard bed."

After crossing what is now the Montana-Wyoming border, they began to encounter the Yellowstone that has since become familiar to millions—the "frozen cascade" of Mammoth Hot Springs, the dark emerald perfection of Yellowstone Lake, Tower Falls, geysers spouting a hundred feet and the multicolored grandeur of Yellowstone Canyon. Moran sketched everything that interested him, sometimes working in watercolors and sometimes indicating colors and features with penciled notes, all to be refined later at home.

He lingered longest at the canyon, riveted by its scale and especially the glittering, subtle hues of its rocks—he had already decided that his "forte lay in color." His excitement when he first looked out from the canyon rim was palpable; Jackson thought he immediately recognized "a fit subject for a masterpiece." This was the most important moment in Moran's life, changing everything that came afterward. The Yellowstone, he would write decades later, near the end of his long career and after a lifetime of travel, "[retains] its hold

In 1872, *Grand Canyon of the Yellowstone*, a 12-foot-wide oil, was bought by Congress for $10,000 and hung in the Senate lobby.

on my imagination with a vividness as of yesterday." He was still painting it even as an uncommonly spry octogenarian.

On August 7, after a little more than a month on the trail, the military escort was recalled, and Moran decided to return with the soldiers to Fort Ellis. A terse entry in his journal suggested that the camp menu might have been wearing thin: "4 biscuits a day for last 5 days." With both his sketchbook and his remarkable memory brimming with Yellowstone scenes, he was eager to get to work. He took a stage to Utah and caught a train home.

In trying to get the Yellowstone on canvas Moran was bucking the conventional esthetic wisdom of the time. It was deemed next to impossible, he wrote to Hayden after setting to work, "to make good pictures of strange & wonderful scenes in nature." All an artist could do in such cases, it was thought, was faithfully reproduce the details, not elevate them to art. Moran thought otherwise. He believed that "the grandest, most beautiful or wonderful in nature would, in capable hands, make the grandest and most beautiful or wonderful pictures; & that the business of a great painter should be the representation of great scenes in nature." He was willing to "cast all . . . claims to being an artist" into the picture he was painting, a 7-by-12-foot canvas titled *Grand Canyon of the Yellowstone*.

"I think he knew that this was a great subject for him and could be a turning point even before he went there," Nancy Anderson says. "He was like Michael Jordan knowing when the ball is coming to him. He recognized the moment. And he knew how to do it, how to get on the expedition and get there. He knew that Albert Bierstadt had already sold a Western painting for $25,000; there was a market. And he had the skill and understanding and visual vocabulary for the task. Nobody ever did Yellowstone better than he did."

Even before Moran finished the large oil, his watercolors were used along with Jackson's photographs to help persuade Congress to set Yellowstone aside as "a public park or pleasuring ground for the benefit and enjoyment of the people." The bill creating the park was signed by President Ulysses S. Grant on March 1, 1872. Two months later Moran's painting went on display in New York, and critics hailed it

DEPARTMENT OF THE INTERIOR MUSEUM

as a masterpiece that instantly lifted Moran into the company of the finest American artists of the time—Bierstadt (SMITHSONIAN, February 1991) and Frederic Church.

But Moran, it soon became apparent, had more than critical success in mind. Leaving his wife and three children at the new family home in Newark, New Jersey, he traveled to Washington to try to sell the Yellowstone painting to Congress for display in the Capitol. He sought Hayden's help in lobbying influential congressmen and won press support for the idea. Congress appropriated $10,000 for the picture in June—the first landscape bought by congressional order—and it was hung in the Senate lobby. "There is no doubt that your reputation is made," Hayden exulted.

The artist was a celebrity now, even though he shunned the limelight and the company of the wealthy that his rival Bierstadt enjoyed. He was nicknamed Yellowstone Moran, a name he liked well enough to sign his pictures with the letters *T*, Y and M entwined like a cattle brand.

But while the Yellowstone had propelled him into fame and five-figure fees, he had otherwise changed not at all. What he wanted to do, then and always, was paint beautiful pictures, and he "cared for nothing else," as his daughter Ruth once wrote, "but the joy of the doing." He'd go where the pictures were, do whatever it took to get there. If that meant eating bacon, which he generally avoided as he did all fats, he'd eat bacon. If it meant killing rattlers and clip-clopping through hailstorms and blizzards, so be it. His chance for a suitable follow-up to the Yellowstone came in 1873, when John Wesley Powell, who had already floated down the Colorado River through the Grand Canyon, invited him along on an expedition to southern Utah and the north rim of the canyon. Moran, who had seen the first photographs of the Colorado canyon, needed no time at all to accept.

The painter and the *New York Times* correspondent Justin Colburn, who had also signed on with Powell, traveled to Salt Lake City by train in July. Then they went south by train and stage before assembling a pack caravan for the trek to the canyon. Moran had an early chance to test his ripening outdoor skills when they decided to climb 11,877-foot Mount Nebo. Proudly, he reported the results in a letter to "My dear Wife" from "your loving Hub, Tom."

"It was an awful climb but we made the top by 12 o'clock . . . and although I do not think I would undergo the labor of another ascent, I would not have missed this for ten times the fatigue. I stood it first rate but Powell, Colburn and Pilling were sick and vomited when we got down. . . . I believe I stood it much better than any of them." The wiry tenderfoot was showing the first symptoms of Western machismo.

Powell left them a few days later at Fillmore, Utah, to powwow with an Indian chief while Moran, Colburn and a skeleton crew continued on horseback. They were now in the spectacular canyon country of southern Utah, where the reds, pinks and oranges glimmered in the recesses of vaulting cliffs and sandstone castles and cathedrals. Late in July they explored the canyon the Mormons called Little Zion Valley. Colburn found it more beautiful than Yosemite. Moran agreed, praising the "stupendous scenic effects" of what would become Zion National Park, but devoted most of his next letter to describing their attempt to help a 10-year-old Indian boy bitten by a rattlesnake.

By early August they were in what is now Arizona. Moran was startled awake one night by a wolf gnawing on rabbit bones a dozen feet away. They got their first good look at the Grand Canyon the next day: "On reaching the brink the whole gorge for miles lay beneath us and it was by far the most awfully grand and impressive scene that I have ever yet seen," he wrote. "A suppressed sort of roar comes up constantly from the chasm but with that exception every thing impresses you with an awful stillness. The color of the Great Cañon itself is red, a light Indian red. . . . All above

PRIVATE COLLECTION

Moran painted *Sunset in Mid-Ocean* in 1904. The artist had a lifelong interest in marine subjects, perhaps inspired by the works of J.M.W. Turner, which he studied as a young man.

the cañon is variously colored sandstone mainly a light flesh or cream color and worn into very fine forms."

He knew at once that he had found a rival to Yellowstone, a scene that in fact would make a perfect companion for his great Yellowstone painting. Powell arrived and guided him to another vantage where they could gaze out over 40 miles of the canyon's length and many miles across. A thunderstorm struck as they stared, the rain falling in dark curtains. Moran sketched to imprint the scene on his mind; here was the view he would paint. And he could hardly wait. He listed the work he had already lined up in his last letter home—more than 125 illustrations for books, magazines and Powell's report in addition to his own watercolors and oils.

Back in Newark he went to work, concentrating on the large canvas he would call *Chasm of the Colorado* (he already had a *Grand Canyon*) during the day while toiling on illustrations until late at night, a work rhythm he would follow for decades. He was immersed in his work—"disappeared so completely in it," his daughter Ruth recalled, "that we children never had to be told, or taught, to reverence it. It was always the first thought of all of us, as it was practically the whole thought and life of my father."

He finished in April 1874. He exhibited the picture first in Newark, then in New York and finally at the Corcoran Gallery of Art in Washington, D.C., once again orchestrating a campaign to sell it to Congress, which obliged with another $10,000 appropriation in July. Powell and many others thought the Grand Canyon painting was as good as or better than his Yellowstone, but the critical reaction was mixed this time. The *New York Times* complained that the picture didn't adequately convey the huge scale of the canyon, disqualifying it as "a true work of art," while another critic accused him of "trying to paint all out-of-doors." If Moran was bothered by any of this, he didn't let on. He had discovered a place he would return to, like a pilgrim, for the rest of his life. And he was ready for more exploring.

His destination in the summer of 1874 was a remote Western mountain steeped in religious symbolism. The Mount of the Holy Cross, about 100 miles west of Denver, had been located by Hayden's men the year before while Moran was tramping through Utah and Arizona. The face of the 14,005-foot peak was creased by intersecting lines of snow in the shape of a cross about 1,100 feet long and 400 feet wide. Moran had seen Jackson's fine photographs of the mountain, which lay in an extremely rugged, barely accessible part of the Rockies, and leaped at the idea of what amounted to a special guided tour when Hayden proposed it.

The trip started pleasantly enough, with meals of fresh-caught trout on the campfire as they traversed lush mountain meadows, but it turned out to be the most punishing slog the artist would endure in a life of wilderness trekking. Alternately riding and walking, they inched up a nearly perpendicular slope cluttered with fallen timber three and four logs deep, then made a precipitous descent to cross a swampy valley to a place affording the best view of the cross. A horse fell 20 feet, tearing a gash in its stomach, and Moran was struck in the eye by a fir branch. They made camp in the rain and finished the climb the next day—"the toughest trial of strength that I have ever experienced," he wrote Mary, "but I stood it all right." Fearless as always, he seemed only minimally affected by the altitude. After celebrating with a lunch of sardines, corn bread and German wine, they climbed up to a point that gave him the perspective he wanted. He was already thinking about how he would arrange the topographic features in a painting—he told Mary that he'd place an especially picturesque waterfall in the foreground. Later that afternoon they retraced their steps back to civilization.

His painting *Mountain of the Holy Cross* was a vertical composition and, at 5 by 7 feet, was smaller than the Yellow-

Both Moran's watercolor (above) and William H. Jackson's photograph (right) capture Yellowstone's Tower Falls.

stone and Grand Canyon canvases. As always, he took special care with the rocks, which he painted with more precision than he did foliage, out of what he once described as "a pure love of rocks." Faulted by some critics for painting "pretty pictures," Moran was often at pains to explain the difference between a literal, photographic reproduction of a scene and an artistic impression, between what he called "realism" and "idealisation." "I place no value upon literal transcripts from nature," he said in one interview. "All my tendencies are towards idealisation. Of course, all Art must come through Nature . . . but I believe that a place, as a place, has no value in itself for the artist [except] as it furnishes the material from which to construct a picture."

As he had done with the earlier Western paintings, he took charge of marketing the *Holy Cross* oil, exhibiting it at the Corcoran and hoping to sell it there, though without success. The critics were again dazzled, the art magazine the *Aldine* declaring that Moran had "made one of those exceptional professional leaps which bridge the chasm between reputation and immortality." It was eventually sold to a British railroad entrepreneur for $4,500. Moran tried to exhibit the painting with the two he had sold to Congress at the 1876 Centennial Exposition (where *Mountain of the Holy Cross* was awarded a medal), but Congress refused to loan them. The three-canvas triptych he envisioned has finally been achieved at the current National Gallery exhibition.

By the time he turned 40, in 1877, Moran had established a work routine that suited him perfectly: travel, paint, do engravings and etchings, hustle work when necessary, travel and paint some more. He paid the bills with his big canvases and the magazine illustrations he did continually, but he worked in almost every graphic medium—wood engraving, lithography, etching, pen-and-ink drawing, watercolor. He drew in rented studios and at home, unfazed when visitors wandered in and out, always able to concentrate. He did commercial jobs without apology, working on books and brochures for several different railroads, among other clients. Commercial work posed "no threat to an artist," he maintained. "The real artist will express himself anyway." Money couldn't corrupt Yellowstone Moran.

"He seemed always to be starting off or coming back from strange, beautiful places," his daughter Ruth remembered. He went to Florida in 1877. Two years later he was in the West again, on a weather-plagued trek to the Teton Mountains. At one time or another Moran got a long look at almost every beauty spot in the West. He saw Taos and the Chama Valley in New Mexico, Mesa Verde in Colorado, the Ruby Mountains in Nevada, Cottonwood Canyon near Salt Lake City, the Sierra Nevada, the Snake River Valley and Shoshone Falls in Idaho, Devil's Tower in Wyoming. He traveled by rail, stage, horseback, boat and pack train. He sketched everywhere, painted everything, returned and painted it again, producing a staggering volume of work—no one knows the total number of pieces, but the oils alone number more than 1,200.

"He was lucky in his support system," Nancy Anderson observes. "His wife adored him and ran the house so he had the time and freedom to paint. Ruth took over after his wife died. He was a good family man. He and Mary had a good partnership." His wife became an accomplished etcher herself, winning several prizes and selling steadily. They moved to New York and in the 1880s began summering in East

GILCREASE MUSEUM; YELLOWSTONE NATIONAL PARK/NATIONAL PARK SERVICE

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Moran's toughest trek took him to the heart of the Colorado Rockies, resulting in *Mountain of the Holy Cross*, 1875.

Hampton, Long Island, eventually building a home and studio there. "He made a great deal of money," Anderson says, "but you wonder where it went. He didn't leave a fortune behind and he never lived high. Maybe he spent it traveling." He was never seduced by celebrity—unless he could convert it to cash. "I have been quite lionized the last few days," he wrote Mary from Denver in 1892, "but I do not see any clear financial results from it."

It was on that journey West that Moran hiked down into the Grand Canyon for the first time, at age 55, using ropes to bypass several waterfalls—a "glorious trip," he wrote to Mary after the arduous two-day scramble. Later that summer he rejoined his old friend William Jackson for a jaunt to Devil's Tower, Wyoming, that became an ordeal by hail. Moran described the storm in his only published magazine article: "an awful fusillade of ice-balls that struck us with a force as if coming from a sling." Their horses nearly stampeded, and their hands turned purple from the pelting hail.

He remained preeminently a painter of Western landscapes, but tastes were changing and the grand Western vistas were becoming more familiar. A new version of *Grand Canyon of the Yellowstone* drew respectful if not enthusiastic attention at the 1893 Columbian Exposition in Chicago while failing to sell. The critical tone changed as well, as illustrated by a damned-with-faint-praise review of a superb painting of Idaho's Shoshone Falls a few years later. The critic acknowledged Moran's "brave and earnest effort to portray a grand phase of nature" and commended "an impressiveness which cannot be reasonably ignored. That our preference may not be for the grand and panoramic in nature," he added, "is beside the question." Moran broadened his scope somewhat after an 1886 visit to Venice, which he described as "a dream" and which he returned to repeatedly, painting ever-salable views of St. Mark's Square from the water. He became so infatuated with Venice that he eventually bought a 38-foot-long gondola and shipped it home to Long Island.

Even as a young painter Moran had been viewed by many in the art world as old-fashioned, as an artist clinging to obsolete notions, and he never mellowed nor changed. He fulminated about fads, European influences, artistic egotism. Cubism in his view was "against truth; it is a striving to express the intellectual in [the] form of art which cannot be done." The "highest art lies in the concealment of art," he insisted. "I don't care anything about paint; I want to see what [the artist] says with it."

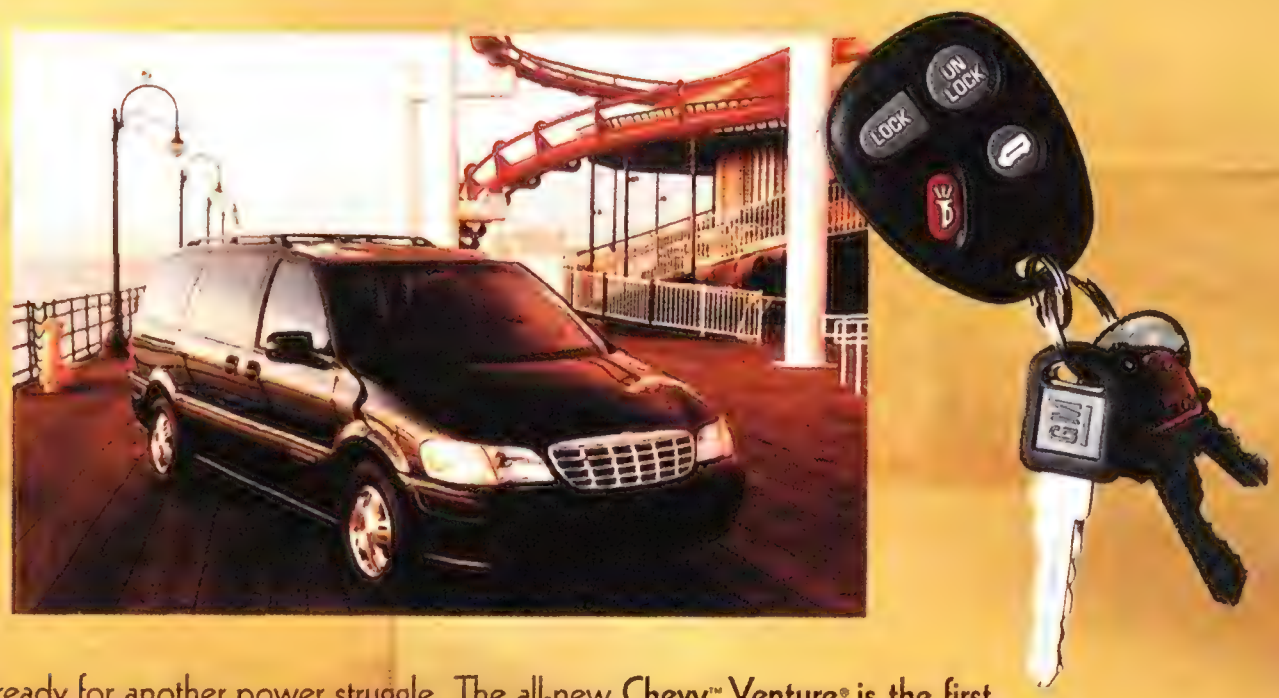
After Mary died in 1899, Ruth became Moran's companion, accompanying him on his rambles to Europe and the West, especially the ever-alluring Grand Canyon. He traveled and painted into his 80s. A 1922 visitor to his studio described Moran at work at 85: "He never took his eyes off the canvas. He would get far over to one side and almost across the room studying the painting closely. Then he would hurry across the studio with his brush poised, make one little stroke and back away, looking neither to right or left."

He and Ruth spent his final few years in Santa Barbara, California, where he died at 89 in August 1926. "He died looking at the cracks of the ceiling," Ruth recalled, "making Venice out of their patterns, just as, all his life, he had lingered at marble panels and stained wood, seeing pictures in the lines."

His admirers dubbed Thomas "Yellowstone" Moran the "father" of the national park system because his paintings made the Western wonders real and vivid in the American mind. Moran probably shrugged off the tribute; he was a painter first and last, a maker of beautiful pictures, not a promoter or "father" of anything. Still, Nancy Anderson believes "he defined the West in a sense for all of us. I went to Tower Falls in Yellowstone to follow his tracks while working on my book, and I came to an outlook point on a winding Park Service trail. The marker there had a color reproduction of a Moran painting on it, showing the view from where I stood. I found other paintings of his on markers around the park. Even today, I thought, here are his images defining the way we look at the landscape."

In his career as a freelance writer, Donald Dale Jackson has profiled many of the Western places immortalized in Moran's art.

GENE AUTRY WESTERN HERITAGE MUSEUM, CALIFORNIA



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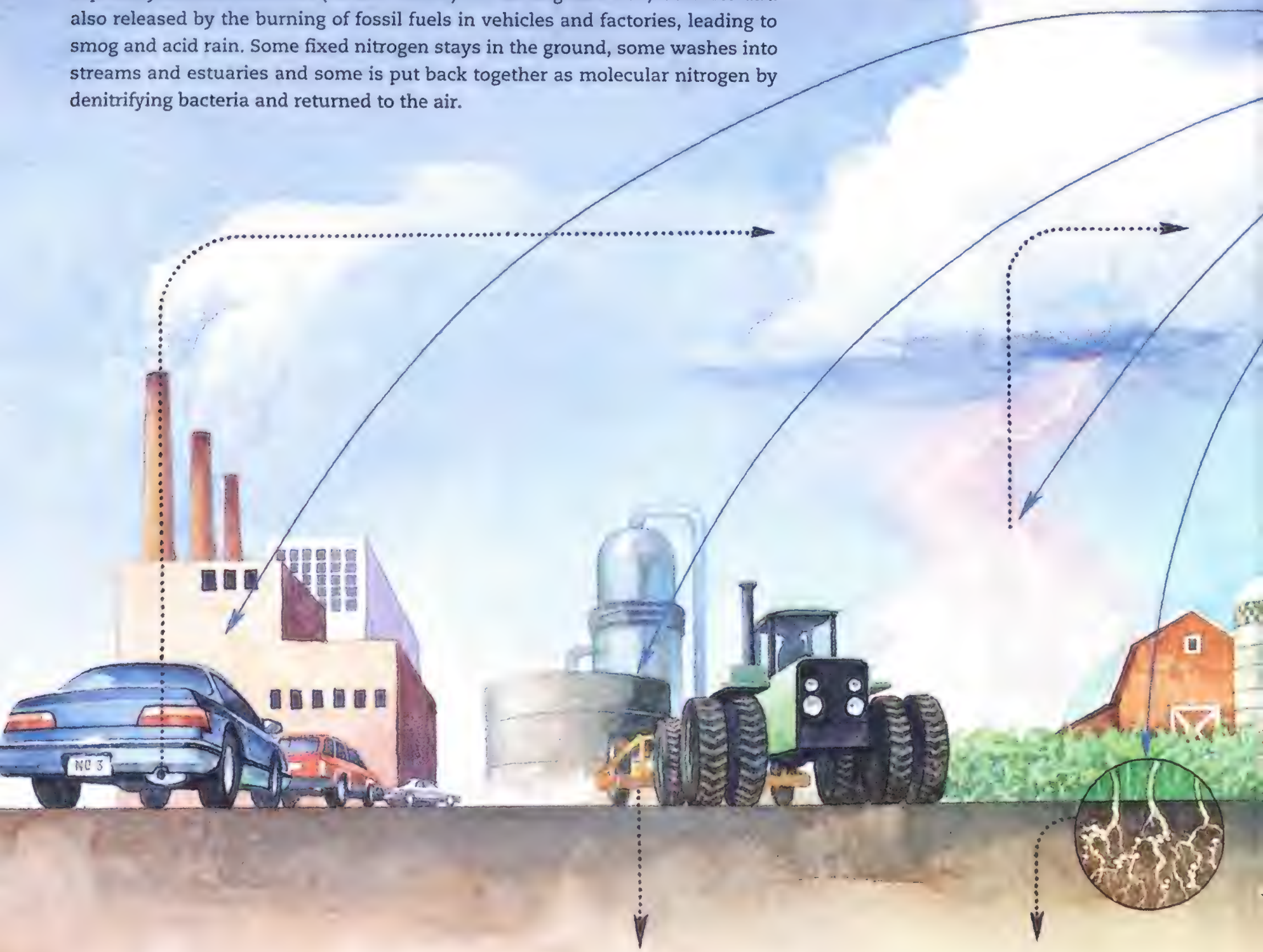
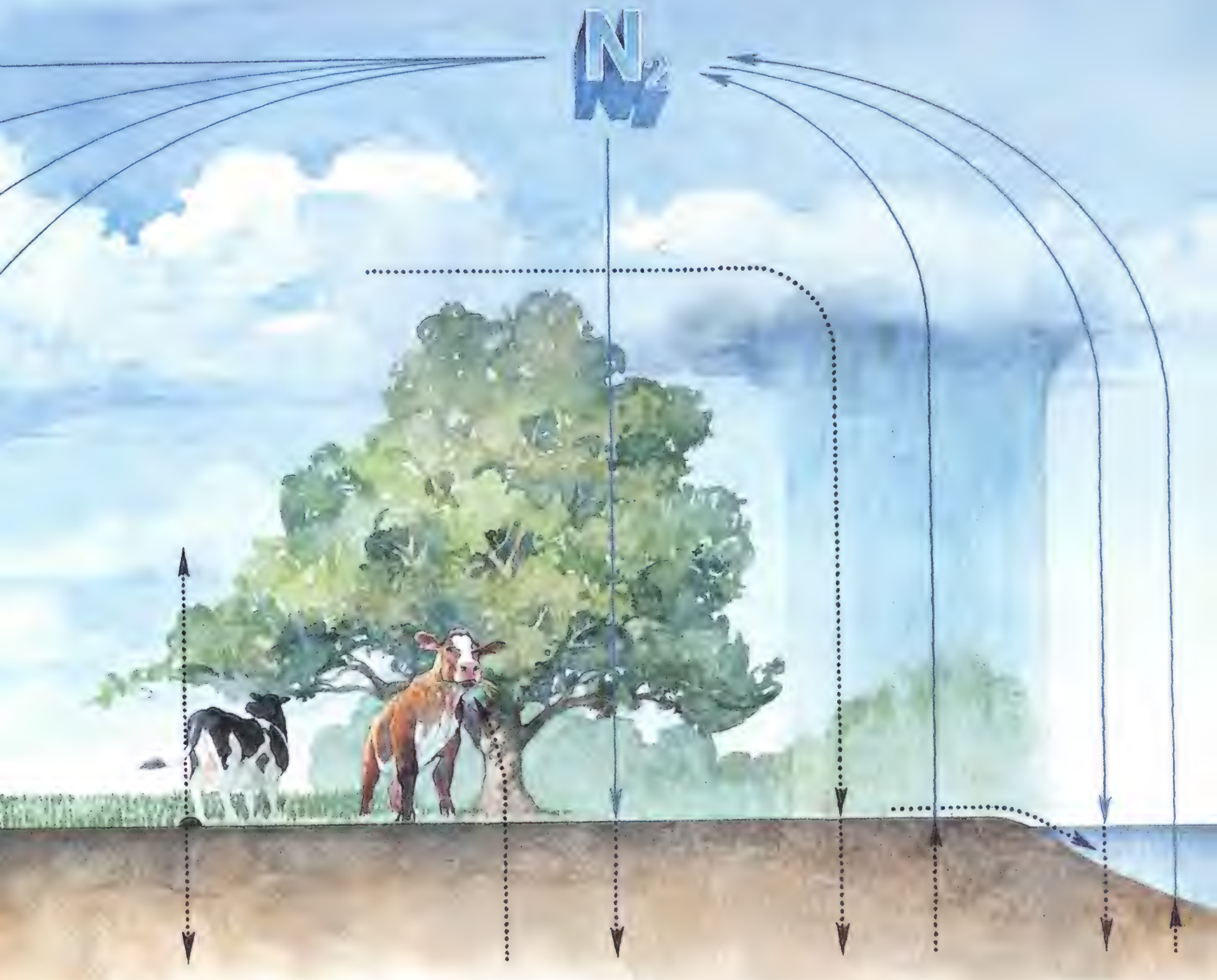
Even a simplified version of the nitrogen cycle is complex. The nearly inert molecule found in the air (solid lines) is "fixed" (dotted lines) and thus made available to plants by microbes in the soil and legume roots (below barn), lightning and especially fertilizer factories (behind tractor). On the negative side, it is fixed and also released by the burning of fossil fuels in vehicles and factories, leading to smog and acid rain. Some fixed nitrogen stays in the ground, some washes into streams and estuaries and some is put back together as molecular nitrogen by denitrifying bacteria and returned to the air.



Nitrogen

BY JAMES TREFIL

IT'S COLORLESS, ODORLESS AND GETS NO RESPECT, BUT IT'S VITAL TO THE CYCLE OF LIFE—AND WE MAY BE USING TOO MUCH



IT'S ALL AROUND YOU, BUT YOU CAN'T SEE IT. You breathe it in with every breath, but your body doesn't use it; you just breathe it back out again. It is one of the most common and important elements in living things, yet few people pay any attention to it. Overworked and underappreciated, nitrogen carries a large part of the load of maintaining the biosphere—and indeed may now be in the process of overloading it. Nitrogen seems to live in the shadow of its more flashy relative, carbon, but now it may be time for us to start paying more attention to it.

Nitrogen is essential to life; it is found in every cell of every living thing. An odorless, colorless gas, it makes up almost 80 percent of the air we breathe. Yet the molecules of nitrogen—each composed of two nitrogen atoms, written as N_2—in the air are of no use to living things. The two

nitrogen atoms in those molecules are so tightly bound that the molecules do not react easily with anything else. For use by living organisms, nitrogen must first be "fixed." This means splitting the nitrogen atoms apart and then attaching other atoms, such as oxygen, to each nitrogen atom so the two cannot recombine. In nature, this is being done constantly, mostly by bacteria, a little by lightning.

The system has worked nicely for a very long time. Before World War I, Germany developed a process to synthesize ammonia, a form of fixed nitrogen. Nitrogen is integral to gunpowder and explosives, and the country could have been cut off from its supply of Chilean nitrate, its chief source of fixed nitrogen. The Haber process involves combining, under high pressure and heat, molecular nitrogen as found in the air with hydrogen, using a catalyst to speed the reaction. This produces ammonia, which consists of one nitrogen atom and three hydrogen atoms. Factory-fixed nitrogen became important, and even indispensable, as a fertilizer as well. After World War II, agricultural use boomed. Now we have contaminated groundwater in some farming areas, and streams and estuaries that are becoming oxygen-deficient because of nutrient—including nitrogen—overload. Learning to fix nitrogen has cut both ways.

In the natural nitrogen cycle, the element is constantly being made into compounds, which are constantly being broken apart again. The world consists of a huge reservoir of molecular nitrogen coupled to a bottleneck: the capacity of bacteria to fix it and thus make it available to living things. When a plant or animal dies, some of the nitrogen compounds remain, fertilizing the ground. Eventually, denitrifying bacteria restore the nitrogen to its two-atom molecular form—along with producing some N_2O, a greenhouse gas that also destroys ozone—and return it to the atmosphere. This is the classic nitrogen cycle, long familiar to ecologists. Although I've described it in simple terms, the actual operation of the cycle is rather complex, with lots of loops, extra steps and shortcuts a given nitrogen atom can take from the time it leaves the atmosphere until the time it returns.

A rotary spreader drops a rain of nitrogen fertilizer pellets on young corn plants, which appear to be thriving.

The world consists of a huge reservoir of nitrogen coupled to a bottleneck: the capacity of bacteria to fix it and thus make it available to living things.

The atmospheric reservoir contains nearly 4 quadrillion tons of nitrogen. Otherwise there are about 20 trillion tons dissolved in the world's oceans and about 100 billion tons of fixed nitrogen on land. Of the fixed nitrogen on land (excluding rocks, sediments and coal), only about 4 billion tons is locked up in living plants and animals; the rest is stored in dead and decomposing plants and animals, eventually to be returned to the atmosphere as molecular nitrogen, as well as in other forms.

Bacteria are by far the most important natural source of fixed nitrogen on land. Estimates vary, but most experts put the total production at 90 to 140 million tons per year. Most nitrogen-fixing bacteria live independently, but many live in nodules on the roots of a family of plants (trees, shrubs, and herbaceous or nonwoody plants) known as legumes.

A small fraction of naturally fixed nitrogen enters the biosphere in a surprising way: as a by-product of lightning bolts. Each second an average of 100 lightning flashes occur somewhere on earth—as many as 500 since you began reading this paragraph. Each stroke heats the surrounding atmosphere to a temperature at which nitrogen "burns" and becomes a nitrogen oxide (one nitrogen atom with one or two oxygen atoms attached). By the time some of this nitrogen reaches the ground in the form of acid rain, it has become a nitrate, one of the forms living things can use. Lightning fixes less than 10 million tons of nitrogen a year.

Since the agricultural revolution 10,000 years ago, and particularly since the industrial revolution 200 years ago, humans have been increasing the supply of fixed nitrogen in three major ways. In order of increasing importance, these are burning fossil fuels, growing legumes and producing industrially fixed nitrogen for use as fertilizer.

Since the middle of the 19th century, humans have been burning fossil fuels, such as coal and oil, to produce steam and electricity and to power vehicles. Just as lightning does, the burning of these fuels converts nitrogen in the air to compounds of nitrogen and oxygen. (It also releases fixed nitrogen in the fuel itself.) Some of this is nitric oxide (NO), a precursor of both smog and acid rain. The burning of fossil fuels adds more than 20 million tons of fixed nitrogen to the cycle yearly.

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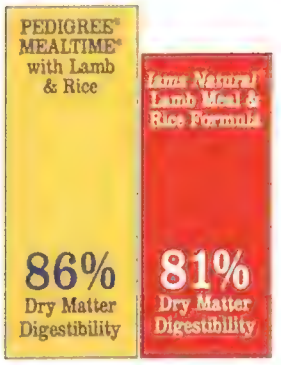

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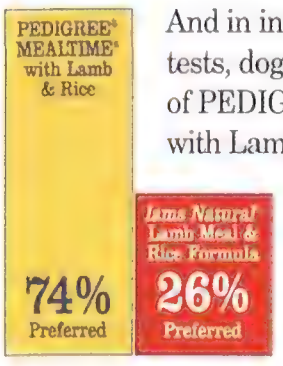

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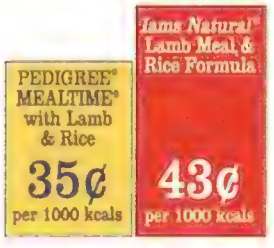

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Farmers have known for millennia that the way to rejuvenate worn-out fields is to plant legumes, thereby returning nitrogen to the soil. Plowing the plants under at the end of the season adds to the restoration. Today leguminous crops add about 40 million tons of fixed nitrogen to the global ecosystem each year.

The supply of fixed nitrogen is often the limiting factor in the growing of crops. Farmers have been spreading nitrogen-rich manure on fields for thousands of years. But the commercial fixing of nitrogen opened up a whole new world. The production of such fertilizers has grown from a few million tons to about 80 million tons today. Not all of that goes to farms. Homeowners use bagged fertilizer that is often a mixture of fixed nitrogen, potassium and phosphate.

Once fixed nitrogen is laid down, some will be absorbed by plants and whoever or whatever eats the plants. Some will simply return to the atmosphere. (Nitrogen compounds that add to the overfertilization of the Chesapeake Bay, for example, are transported through the air from as far as Detroit and Toronto.) Some will be carried away in water on the surface or in the ground. Thus, no matter where or why we apply it, we are adding fixed nitrogen to the global ecosystem.

If we total what is being added by way of fossil-fuel burning, legume growing and commercial fixation, we come up with 140 million tons per year—as much as or more than the contribution of all natural sources on land. Human activity has come to dominate one of the most basic cycles in nature.

Top: Rows of soybeans, which add nitrogen to the soil, flank a swath of corn on this Iowa farm. The crops' places are switched yearly. Above: Nodules on the roots of peas contain bacteria that convert molecular nitrogen to ammonia.

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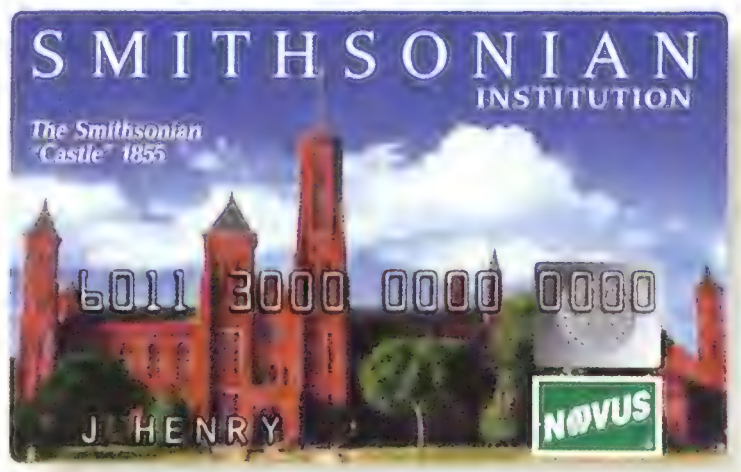

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The yellowish-brownish band that obscures this city is photochemical smog, caused in part by the action of sunlight on nitrogen compounds emitted by cars.

Our activity has always influenced the environment, of course. Think of forests being cleared in Europe and North America, and the use of dikes to take land from the sea in the Netherlands. These kinds of changes were slow and incremental, however. Clearing the forests took centuries. Yet in only 50 years we have come to dominate the nitrogen cycle. In some parts of the world, notably Western Europe, there is the potential for "nitrogen saturation," in which the ecosystem is storing all the nitrogen it can, and any more that is added may be transported into the air or water.

Fixed-nitrogen fertilizers are essential if we hope to feed the world's growing population. So far, we have not only kept up but improved. The calories available per person per day in developing countries rose from 2,140 between 1969 and 1971, when the world's population was 3.7 billion, to 2,520 between 1990 and 1992, when the population had grown to 5.3 billion. This success would not have been possible without the nitrogen.

Two basic questions would seem to be: 1) What would a world with "too much" fixed nitrogen look like? and 2) What can human beings do to make that world less likely?

One answer to the first question comes from a long-term study conducted by David Tilman, of the University of Minnesota, in four grassy fields at the Cedar Creek Natural History Area, 30 miles north of Minneapolis. Parts of the fields were divided into 207 plots, most 13 feet on a side. Some, the controls, received no treatment at all. Others were given essential nutrients, such as phosphorus and potassium, but no nitrogen. The rest were also given nitrogen, at one of seven dosage levels. The plots that received nitrogen produced more biomass, and those that received the most nitrogen produced the most of all.

While the biomass went up, however, the number of species on a given plot went down. Some plants (mainly nonnative grasses) grew more quickly, shading out other plants that were not as efficient in using light. On average, the number of species on a heavily fertilized plot was about half that on unfertilized plots. The plots that received the most nitrogen often supported only one species. In Tilman's words, a nitrogen-rich world would be "green and weedy."

"A nitrogen-rich world won't be brown and shriveled," adds Peter Vitousek, a biologist at Stanford University, "but it will have lower biodiversity, more hazy days and more green scum in lakes and estuaries. It's not a world I would particularly like to live in, but it's important to distinguish between disaster and degradation." He points out that Europe is much farther along the road to nitrogen saturation, but most people do not see it as a bad place to live. The extra haze (coming from nitrogen compounds in the air) and the loss of a few

ALAN PITCAIRN/GRANT HEILMAN PHOTOGRAPHY

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The test patch at left received some nitrogen and has a dozen plant species. Lots of nitrogen was added to the plot at right, leaving only quack grass.

ecosystems (such as heaths in the Netherlands, which are being replaced by grasslands) are probably not noticeable to most people, although scientists and public officials are concerned.

Most experts agree that the farm, and specifically the more efficient use of fertilizer there, is the place to start looking for ways to decrease our nitrogen use. On some farms, fertilizer is applied long before plants can use it, so that most of what the farmer buys and puts on the field is gone before it's actually needed. Vitousek used the term "precision agriculture" to describe techniques now being developed to cut nitrogen use without cutting productivity. It might, for example, be better to apply nitrogen more often but in smaller, carefully timed doses than to dump it on a field all at once.

An example of precision agriculture comes from Pamela Matson (now at Stanford University). On a 37,000-acre sugarcane plantation on Maui, her team from the University of California at Berkeley looked at losses of nitrogen gases from sites where fertilizer was fed to plants through underground irrigation lines in carefully timed doses. Result: the plantation used less nitrogen than other sugarcane plantations in Hawaii, with a large reduction in nitrogen compounds entering the air. "We can reduce the consequences of activity we're not going to stop," Matson says.

A second line of attack involves dealing with fixed nitrogen once it's already in the system. Vitousek points out the possibility of using natural and artificial wetlands as places where nitrogen can be held and returned to the atmosphere as molecular ("unfixed") nitrogen. "All we have to do is provide a place where the denitrifying bacteria can do their work," he says.

For the first time in history, scientists are confronting a situation in which human beings dominate one of the great natural cycles of our planet. "For better or for worse," Vitousek says, "the world is in our hands." Given that, we surely need to have a clearer picture of where we're taking it.

James Trefil is the Robinson Professor of Physics at George Mason University.

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Masked dancers represent an idealized image of male strength and renewal during a celebration honoring the dead on New Ireland Island.

PHOTOGRAPHS BY CHRIS RAINIER

Where Echoes of Spirits Still Dwell

OVER A PERIOD OF TEN YEARS, A PHOTOGRAPHER HAS DOCUMENTED THE VANISHING CULTURES OF THE STONE AGE TRIBES OF NEW GUINEA

NEW GUINEA, AN ISLAND DIVIDED IN HALF POLITICALLY—independent Papua New Guinea and Indonesia-governed Irian Jaya—has 1,000 aboriginal tribes, each with its own language and traditions. Their rituals marking life passages—celebrations for the birth of a child, mourning at a death, a marriage feast, initiation rites for coming of age—are unique from one tribe to the next. The imaginative use of masks, body paint and costumes, mixed with the people's profound belief in spirits who control their lives, created an irresistible temptation for photographer Chris Rainier. He spent months every year traveling New Guinea's coasts and highlands, and remote areas marked "no data available" on maps.

"I wanted a visual diary of the place where echoes of spirits still dwell," says Rainier, who journeyed by canoe and by foot "in mud up to my waist." In Irian Jaya he spent weeks in a swamp infested with leeches that so covered his body that he peeled off 50 at a time. "I could not burn them off—hard to do in a downpour—so I carefully sliced the leeches off with a machete, which sometimes left their tiny heads buried in my flesh." He suffered from malaria and ate everything from insect larvae to bats. But in the end, "I had the pictures I wanted," he says, and had learned from the people "how to fit quietly into their cultures."

Rainier's visual diary tells the story of his encounters with chieftains crowned with headdresses of bird-of-paradise feathers; warriors with bodies covered in bright paint as they went to battle over land at issue for hundreds of years; young women laden with shells and feathers, anticipating their wedding feast; and initiates, their faces painted like masks, going through the secret rituals of passage into manhood. Rainier's New Guinea photographs began a world tour at the Australian Museum in Sydney and are currently on exhibition at the Papua New Guinea National Museum. They are also featured in his most recent book, *Where Masks Still Dance*, published last year by Little, Brown and Company.

"In New Guinea," says Rainier, "I came unconsciously expecting a glimpse of mankind in the vestiges of Eden, but I found no romantic savages with mystic knowledge in the rain forests. In this land of a thousand languages, I simply found humans with a distinctive culture living their joys and sorrows. Whatever the spirits that still invest the forest, whatever the legends that bring forth the masks and their dance, I came to see how very much we are all the same."

—Marlane Liddell

The majestic bird-of-paradise-feather headdress on a Minj tribesman indicates he is a person of importance. He is dressed in full costume to perform in a sing-sing, a gathering of many clans in the Papua New Guinea highlands.

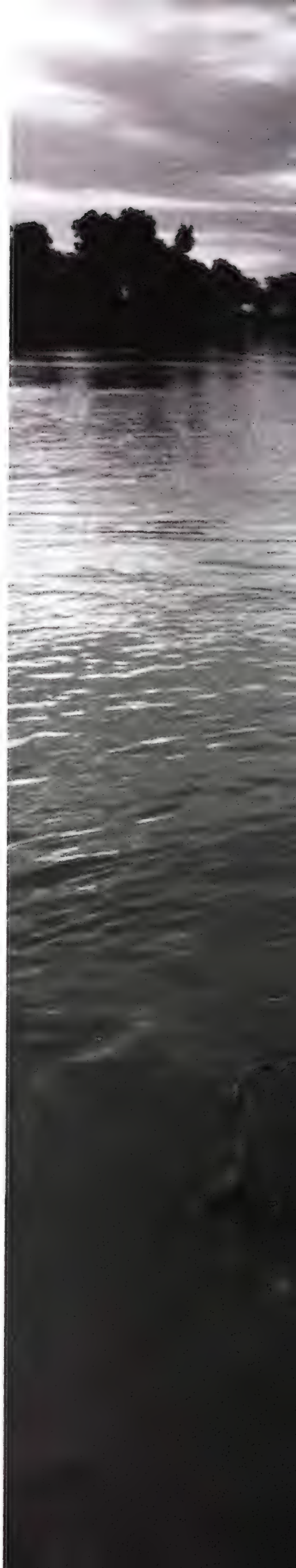
In the Mount Hagen area in Papua New Guinea, two women mourn the death of a village member. Their usually clean, well-oiled bodies are covered with flaky, dull mud, symbolic of death and decay. The women cover their heads and wear multiple strands of gray grass seeds called Job's tears. The necklaces are removed one strand a day until the mourning period, which can last for months, is over.

A young Minj woman from the Wahgi Valley in Papua New Guinea is dressed in a traditional bridewealth costume. She wears her finest feather ornaments and body paint for the presentation of the bridewealth of shells and pigs from her future husband's family to her family. Her array of finery shows off her vitality, beauty and good health and is an indication of the wealth of her family.

An Asmat warrior covers his face with an ancestor's skull decorated with a large shell nosepiece. When an important person dies in this Irian Jaya tribe, the body is wrapped and left on a platform until it completely decomposes. The skull is inherited by the eldest male child, who keeps it close to him, using it as a pillow at night or carrying it on his chest or back during the day, and is thus protected by it at all times.

In a mangrove forest, an Asmat dancer participating in a *jipae* festival wears a fiber costume representing the spirit of a deceased villager. The event celebrates the passage of the dead to the spirit world. The dancer visits the home of the deceased where he is welcomed by the grieving family. At dawn, after dancing and feasting all night, the spirit dancer returns to the forest, symbolic of the realm of the dead.

Sing-sing performers, wearing bamboo fingers, stripe their bodies to imitate zebras, an inspiration from the world outside their Papua New Guinea highlands village. After World War II, sing-sings were organized by the colonial government to promote regional peace among all the participating tribal clans. Today the spirit of individuality and innovation in costume and dance continues.



An Iatmul initiate's face is covered in intricately designed patterns that function as a protective mask. Initiation among the Iatmul of Papua New Guinea is a defining ritual marking the passage into manhood and calling into action the world of spirits and ancestors. Although initiates are usually adolescents, periods of education or work away from the village often delay this important ritual.

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November 11, 1940: Code-named "Quad," two prototype vehicles are delivered to Camp Holabird in Maryland for testing. U.S. Army officials promptly order 1,500 more.

October 30, 1996: Petersen's 4-Wheel & Off-Road hails all-new 1997 Jeep Wrangler as 4x4 of the Year. (Fifth time the title is bestowed on a Jeep vehicle—more than any other brand.)

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April 23, 1944:
Theories on the origin of the Jeep® name prompt a Washington Post editorial. One unlikely view holds it was coined after the Popeye comic strip character, "Eugene the Jeep." Others believe it was short for "GP," or general purpose. Either way, the name stuck.

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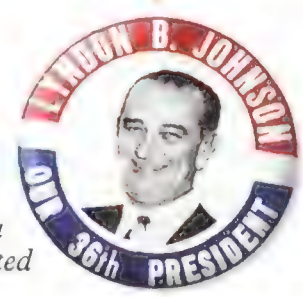
Willys MB changes into civilian garb with the introduction of the Willys Universal. Modifications include removing the gun holster from the windshield.

August 29, 1953:
California's Rubicon Trail plays host to the first-ever Jeep Jamboree. Later that evening six Jeep owners perform an impromptu cancan number around the campfire.



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Astride the engine mount to make repairs, Fred Key waves to a photographer. *Ole Miss* had then been 553 hours in the air.

They Flew & Flew

BY EDWARDS PARK

HOW TWO BROTHERS IN AN OLD CURTISS ROBIN SET A RECORD THAT'S STOOD FOR 62 YEARS

ENTER THE NATIONAL AIR AND SPACE Museum from the Mall, and turn right to a first-floor gallery, "Golden Age of Flight." Over in a corner of the gallery hangs a blocky old high-winged monoplane, a Curtiss Robin, built in Missouri in 1929. She's not very big—41-foot wingspan and room for three people. Her fuselage displays the state flag of Mississippi and also a pair of crossed keys. What catches your eye is a metal catwalk stretching from cabin to engine with a man standing on it.

You've got it. You're looking at *Ole Miss*, an ordinary plane with extraordinary modifications that allowed two extraordinary brothers, ages 30 and 26, to set an extraordinary record in 1935.

Algene and Frederick Key were the sons of Dr. and Mrs. Elmore Benjamin Key of Meridian, Mississippi. Originally a railroad town, Meridian turned air-minded during the first part of the century, especially in 1923, when a barnstormer flew into town and tied his plane down in a pasture. Nice young fellow named Lindbergh.

Three years later, while Lindbergh was dreaming of flying to Paris, Al Key enrolled in a flying school in Missouri. Fred quickly followed him. The two learned to fly, barnstormed a bit, then set up their own flying school back in Meridian. Soon they were managing the new municipal airport. Aviation moved fast in those days.

But the Depression brought it back to earth. With unemployment at nearly 14 million in 1932, few people wanted to spend five bucks on an airplane ride. Both Keys were married. Expenses rose. Having a doctor for a dad sounds as though money was no problem, but in the 1930s, country doctors were apt to get paid with a dozen eggs or a smoked ham. Still, the brothers couldn't just watch the Meridian airport turn back into a pasture. They knew what it needed: a shot of publicity. Like setting some sort of record.

Lindbergh had reached Paris, nonstop, in May 1927. Racing and high-altitude flights cost like fury. But how about endurance? Chicago's Hunter brothers had set the official record in 1930—an astonishing 553 hours, 40 minutes. Dale Jackson and Forest O'Brine of St. Louis soon broke that, but their barograph, the all-important device that recorded altitude and hence all landings, hadn't been properly set, so their record of 647 hours, 28 minutes wasn't official. A new endurance mark was the Keys' best shot. If the flight took place above Meridian, it would put the town and its airport on the map.

The Flying Key Brothers and Their Flight to Remember, by Stephen Owen, makes clear how old-fashioned neighborly networking in a Southern community helped the Key boys get off the ground. W. H. "Bill" Ward loaned a plane to the Keys—a Curtiss Robin J-1 Deluxe, with a 165 horsepower Wright Whirlwind radial engine. It was the same make as, but less powerful than, the Whirlwind engine that took Lindbergh to Paris in 33½ hours. Could it hold up for more than 650 hours?

The plane, christened *Ole Miss*, needed plenty of work. Al and Fred took out its three seats and welded in an extra 150-gallon fuel tank. The pilot's seat was built into the forward end of the tank. Above the tank there was just enough clearance for the brothers to scramble back to the rear luggage compartment, which was fitted out with a mattress. A new hatch on the cabin roof slid open to take in fuel and supplies from a refueling plane, though

Cleaned up a bit but still dog-tired, Fred, left, and Al Key, with wives, Louise and Evelyn, cling to a strut during an early celebration of their 27 days aloft in *Ole Miss*.

ABOVE AND PP. 94,95: UPI/CORBIS-BETTMANN

The Keys' father supervised their diet so they wouldn't get sick. "As a physician I'm sure he was far ahead of his time," said Fred's wife, Louise. "He insisted they have a quart of orange juice every morning. . . . We prepared every bite that was sent up to them. . . . Supper included things like steak, chicken, rice—and always their mom's corn bread muffins."

they did not yet have one. Al was over six feet tall, so Fred, smaller, got the job of refueling.

Bees had mated in midair for millions of years, but in the 1930s air-to-air refueling was still a dramatic innovation. It had been done on other endurance flights but not with the dexterity of bees. After some persuasion, James Keeton offered his own Curtiss Robin as the refueling plane. It, too, needed a big new fuel tank in its belly. Keeton agreed to pilot it himself. Al Key had taught him to fly; besides, he needed flight time.

"I wanted to be an airline pilot," he would later explain. And no wonder. The job paid $8,000 or so a year—a princely sum during the Depression and almost twice what a lawyer made in those innocently unlitigious days.

Bill Ward said he'd be in charge of lowering the fuel hose and supplies. Fred Key could slide open the hatch on *Ole Miss* and grab them. Fred would also have to service the Whirlwind engine in flight, so he asked metalworker Dave Stephenson to make him a special catwalk. Dave sketched it in chalk on the hangar floor. "How big do you want the open gaps?" he asked. "Just big enough so my foot won't fall through," replied Fred.

Slightly flattening the propeller's fixed blades added a little power and made for a smoother-running engine. Shortening the exhaust stacks of the five cylinders allowed the Keys to judge fuel mixture by the color of the exhaust flame. Blue was good; yellow meant wastefully rich. Stephenson noted that if gasoline from the hose spattered the exhaust area during refueling, "Poof! No more endurance flight."

To avoid that possibility, a local mechanic and all-around genius named A.D. Hunter fashioned an automatic cutoff valve for the hose nozzle. It was triggered by a probe within the receiving tank's inlet pipe; no fuel could leave the hose unless the nozzle was safely in place.

Ben Woodruff, a local radio buff, installed a two-way radio. It needed batteries and a wind-driven generator. Unfortunately it didn't always work, so the pilots sometimes had to rely on visual signals from the ground. Years later James Keeton remembered that when he and Ward were aloft and couldn't see *Ole Miss*, they'd check a patch of very green grass beside the airfield. One of the ground crew would wear a white shirt and stand there with a long cane pole that had a big white flag at the end of it, and he'd point in the direction of *Ole Miss*.

To keep the 40-foot fuel hose from lashing about in the slipstream, the crew got a plumber to cover the lower end with a tear-shaped blob of lead. The supply bag also whipped around until they put in a big, round milk can to reduce its wind resistance.

Despite their mother's thin-lipped disapproval ("I don't think that any mother could ever have given her encouragement to such a dangerous undertaking," she said), the Key boys finished preparations. On June 21, 1934, *Ole Miss* received her barograph, sealed in the tail section where no one could get at it in the air. Then, as 10,000 people cheered, she trundled into the air. Everything went well at first, but on the fifth day, Fred saw jittering little flames around one cylinder head. It turned out that the last load of gas had been 52 octane instead of 80. Burning unevenly, the coarser fuel overheated the engine, loosening the cylinder. The

brothers tried to stave off disaster by securing the loose cylinder with a metal brace, but that only worked for a while. After 123 hours in the air, fearing the head might come off at any moment, they set *Ole Miss* down.

The bad fuel had virtually destroyed the engine; it had about 15 minutes of life left in it. The catwalk had shaken loose, too, and probably would have dumped Fred Key to his death the next time he stepped on it.

Exactly a month later the Keys tried again. This time only 1,500 showed up to cheer. With a new engine bought at a special cut rate with money from a new fund drive, *Ole Miss* surged into the air. The catwalk had been rewelded; the radio was fixed. And every pint of gasoline would be strained seven times before it was sent up. But on the sixth day, violent Mississippi thunderstorms and gusty winds virtually blew them out of the sky. After 169 hours, her exhausted pilots brought *Ole Miss* down in a slashing rain.

"Will you try again this year?" a rain-soaked reporter shouted. Not this year, replied the dejected Keys.

Next year was another story, in part thanks to the brothers' friend Maj. Claire Chennault, leader of an aerobatic team of three Army fighter pilots and later commander of the famed "Flying Tigers" in China during World War II. Chennault saw to it that *Ole Miss* was equipped for blind flying with an artificial horizon, a directional gyrocompass and a sensitive altimeter. "Take good care of them," he told Al and Fred, "because they're signed out on my signature at Maxwell Field."

The Keys took off for the third time on June 4, 1935. This time only a hundred people bothered to turn out. The national press yawned. Italian troops were about to attack Ethiopia; the U.S. Congress was arguing about Franklin Roosevelt's New Deal legislation—including a crazy scheme called Social Security. Who cared about a couple of rubes in Mississippi making another apparently hopeless try at setting an endurance record?

Keeton speeds up to 90 miles an hour. Now, here comes Ole Miss, *up and just under Keeton, matching speed exactly. Clipping on his safety line and leaning far out, Bill Ward lowers the hose. Fred Key, reaching up from his open hatch, gropes for it, gets it and sets the nozzle in the tank's receiving pipe. That opens the valve. Refueling takes six minutes.*

Ole Miss' engine sang sweetly day after day, while her pilots slid into the strange routine of their life aloft. On a full tank, *Ole Miss* could stay airborne about 16 hours. But because of the logistics of air-to-air refueling, she could only take aboard 60 gallons of gas at a time. So life revolved around four refuelings a day plus the transfer of oil in cans and food cooked by the brothers' long-suffering wives. Picture it: at first light, the night watch stationed at the airfield to keep tabs on *Ole Miss* sounds reveille on Keeton and Ward. Already gassed up, they quickly take off to locate the Keys, who are flying a broad figure-eight pattern over Meridian. Keeton enters the pattern and holds course above and ahead of *Ole Miss*. He speeds up to 90 miles an hour. That keeps the plane smooth. Besides, as he observed later, "it gave us a good margin over stalling out."

Now, here comes *Ole Miss*, up and just under Keeton, matching speed exactly. Clipping on his safety line and leaning far out of Keeton's cabin, Bill Ward lowers the hose. Fred Key, reaching up from his open hatch, gropes for it, gets it and sets the nozzle in the tank's receiving pipe. That opens the valve. Keeton now has to fly perfectly steadily with the five-gallon oil can in his lap until Ward is ready for it to be lowered. "We took more chances than the Key brothers," Ward later told a young reporter.

Refueling takes six minutes—ten gallons a minute. Then Ward retracts the hose and lowers the supply bag. Here comes the oil and various items

NATIONAL AIR AND SPACE MUSEUM

from razor blades to the daily paper.

The second contact of the day, a few hours later, brings brunch along with the fuel. The afternoon delivery contains supper. By that time the Mississippi air is as bumpy as a logging road, but both planes must hold steady. The final tryst, in the last glow of sunset, fills the tank. No one wants to face that job in the dark of night.

And so, day after day and night after night, the brothers flew. Fred routinely got hit in the face by the supply bag and was once clocked by the fuel nozzle when he missed his grab for it. The Keys' father supervised their diet so they wouldn't get sick. "As a physician I'm sure he was far ahead of his time," said Fred's wife, Louise. "He insisted that they have a quart of orange juice every morning. . . . We prepared every bite that was sent up to them."

Louise and Evelyn (Mrs. Al) got up early every morning to cook their husbands' breakfast. "Supper," said Louise later, "included things like steak, chicken, rice—and always their mom's corn bread muffins."

Human waste? They neatly dropped it into a convenient Mississippi swamp. "There wasn't even an alligator in that swamp," recalled Keeton. "Just snakes."

Their wives worried about the two quarreling, "cooped up together like that." But hardship drew them together.

Fred's engine repairs and maintenance took place as needed, any old time. With the plane throttled back to about 65 mph he found it easy to add oil. His handiest way of inspecting the engine mounts was to straddle the engine—something you can do with an air-cooled radial without frying yourself. Fred rode the engine as if on horseback. One reporter, flying up to look *Ole Miss* over, found Fred perched there, cleaning the windshield with one hand, holding a cold drink in the other. He didn't wear a parachute. Too much air resistance. Instead, he put on a lineman's harness, clipping the safety line to the catwalk railing.

Off duty, one brother could lie back, partly sitting, on the thin mattress behind the fuel tank. His legs rested on the tank. When Fred was at the controls, Al did sit-ups as prescribed by his father. Neither got more than three hours of fitful sleep at a time. Fatigue gradually slowed and dulled their quick flyer's reactions. Early in the flight, for instance, they reacted in a flash when an unlit plane suddenly appeared in the starlight, bearing straight at them. A close call. Much later, just as Fred, dead tired, stepped out onto the catwalk, and before he had clipped on the safety line, *Ole Miss* hit a savage bump that nearly tossed him overboard; he barely caught hold of the catwalk.

Then Al got an abscessed tooth. A local dentist suggested an iodine-soaked needle. When the supply plane brought it up, Al followed radioed instructions and lanced the abscess himself.

The days passed. Locals joked that Louise and Evelyn were going to divorce the brothers for desertion. The Chicago Cubs seemed to be closing in on the pennant. On June 13, as the Keys were droning along above Mississippi, Jim Braddock beat Max Baer for the heavyweight title of the world.

By June 27, 1935, the easygoing little community was bulging with cars and a crowd of about 35,000 people. At 3:13 P.M. the public address system at what had just been renamed Key Field counted down the last dramatic seconds. A great cheer went up; the Meridian Boys' Band played "Praise God from Whom All Blessings Flow"; and Major Chennault's stunt team of three Boeing P-12s slid into formation with *Ole Miss* and helped her buzz the field.

She was all cleaned up and airworthy when she made her next notable flight. It was to Washington, D.C., with Fred Key along as pilot to turn her over to the Smithsonian.

The brothers had broken the Hunters' official endurance record. But they did not land. *Ole Miss* was still about 94 hours short of Jackson and O'Brine's unofficial record. Hanging in for four more days gave the elements plenty of time to whomp up a mean thunderstorm, which wrenched the tired old plane mercilessly, and dangerously loosened a stabilizer brace.

Friends begged them to land, but they kept on. On June 29, a Fox Movietone newsreel cameraman went up with Keeton and Ward to film the refueling. Smoke suddenly poured from *Ole Miss*. A metal oil can had shorted out some wires, starting a small fire. The only person to get excited was the cameraman. Al coolly cut the throttle, putting *Ole Miss* in a glide. Fred broke out the fire extinguisher. By the time he'd doused the flames, the plane was barely above the treetops.

Wearily, *Ole Miss* and the Keys greeted July 1. Their right tire was flat. The stabilizer might give way at any moment. They were both numb with fatigue. At 12:02 P.M. they passed Jackson and O'Brine's unofficial record to become the undisputed endurance champs of the world. It would have been nice to hold out a couple more days for a red-white-and-blue Fourth of July landing, but they decided to pack it in. The historic moment was planned for 6:30 P.M., then threats of more stormy weather blew up. At 6:06 on July 1, *Ole Miss* touched down for the first time since June 4. She had no problem with the flat tire, but it was floppy as she taxied toward the hangar. Just as the big crowd headed toward her, the Robin's faithful Wright Whirlwind stopped. The idling propeller stopped. The noise stopped. The motion stopped—for the first time in 27 days.

That engine had run perfectly for 653 hours, 34 minutes. It had flown the Keys more than 52,000 miles, a distance roughly equal to twice around the world. It burned 6,000 gallons of gas and 300 of oil, all passed air-to-air. Even so, the engine was fine. All it needed was "three exhaust valve grinders and one rocker arm bearing assembly." They gave it a ring job, too, just for luck.

The Key brothers took a few days off to sleep and eat. Al had lost 25 pounds, Fred 17. Both had sties all around their eyes—"probably from the exhaust," their father diagnosed. So much oil had "soaked into their skin," Fred's wife said, "we finally had to take them over to the state mental hospital and make them sit in steam baths for a couple of hours." That seemed appropriate; as Fred put it, "some folks felt anyone who'd stay up in an airplane 27 days was crazy."

The brothers both flew in World War II as bomber pilots. Their planes were invariably named *Ole Miss II, III*, whatever. Al stayed in, becoming a colonel, and later served two terms as Meridian's mayor. Fred ran the Key Brothers Flying Service at Key Field in Meridian until his death in 1971. Al was killed in a car crash in 1976.

After her epochal flight, *Ole Miss* looked disgraceful—oil-smeared, weather-beaten, her fabric torn, wires and braces in need of tightening. But she was all cleaned up and airworthy when she made her next notable flight, 20 years later. It was to Washington, D.C., with Fred Key along as pilot to turn her over to the Smithsonian.

Refueling became an important element in national defense, and A.D. Hunter's cutoff valve was the grandfather of those used by the modern tanker planes that keep our fighters and bombers in the air. But no plane kept aloft by refueling has ever beaten the Keys' record. It *was* beaten in 1973: the astronauts who did it, in *Skylab II*, had to escape the pull of gravity.

Edwards Park flew fighter planes in the Pacific during World War II. He is a longtime editor of and contributor to this magazine.

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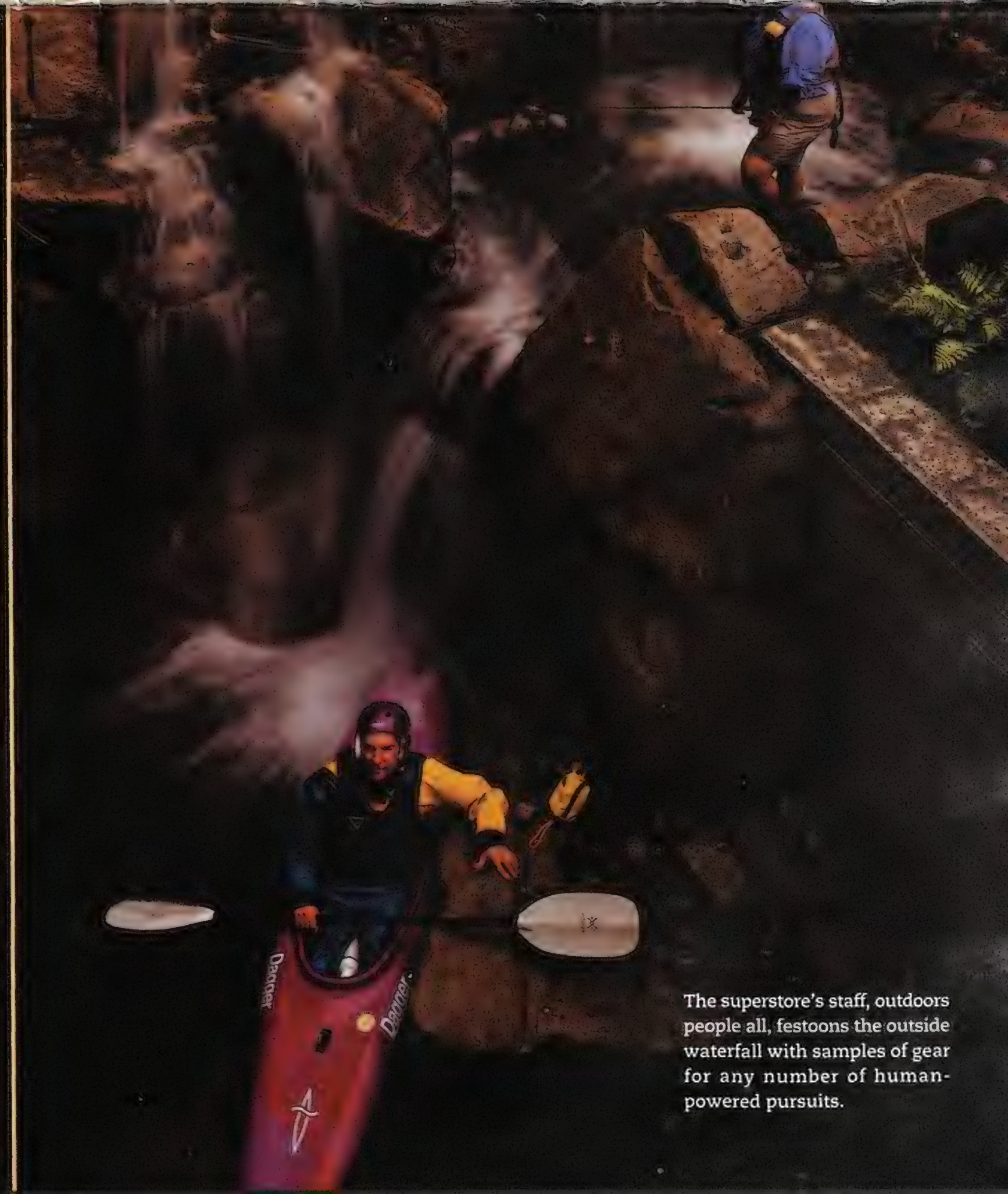
For Those Who Want To Play Outdoors,

Here's a Horn of Plenty

BY SCOTT MCCREDIE

REI WAS STARTED IN THE BACK OF A GAS STATION IN 1938. NOW THIS CONSUMER CO-OP IS THE NATION'S LARGEST

PHOTOGRAPHS BY REGIS LEFEBURE

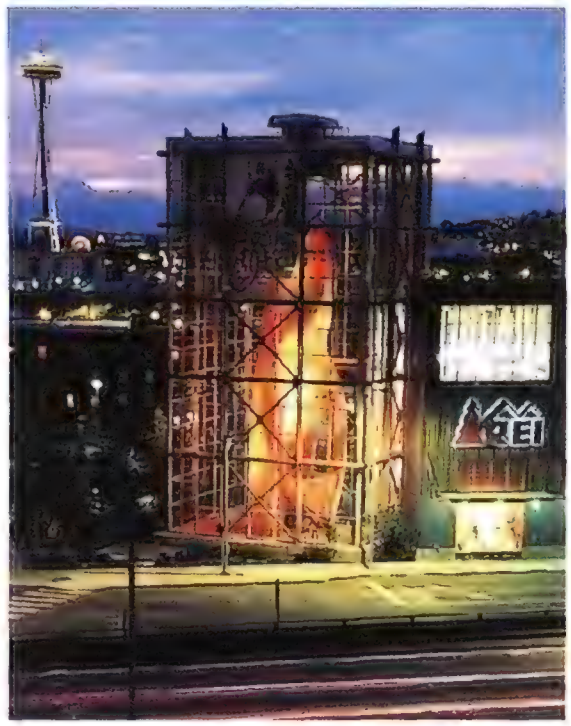


The superstore's staff, outdoors people all, festoons the outside waterfall with samples of gear for any number of human-powered pursuits.

BILL BIDDLE, A 67-YEAR-OLD RETIRED ENGLISH AND HISTORY TEACHER, USUALLY prefers wilderness camping. But the wee hours of a late summer morning find him bivouacked on a Seattle sidewalk at the corner of John Street and Yale Avenue, a block away from Interstate 5. At 4:30 A.M., he is awakened by the first of several hundred people arriving for the grand opening of the new REI (Recreational Equipment, Inc.) $30 million flagship store.

Lying next to Biddle are his vintage wood-handled ice ax and one of the four old Trapper Nelson packs he owns. He emerges from his tent at about 5:30 dressed in a climbing parka and wind pants he bought in 1954, now dotted with leather patches. His gear, he explains, "extols the antiquity of REI," the 59-year-old company that is one of America's largest and oldest outdoor equipment retailers, as well as the nation's biggest consumer cooperative, with 1.4 million members.

In many ways Biddle is the quintessential REI customer of the old school. He leads canoe trips, teaches cross-country skiing, camps in all seasons, mountain bikes, climbs, snowshoes and is learning to fly-fish. He has collected so much gear over the past 40 years that one house cannot contain it all. (He keeps the overflow at a vacation home.) He is fiercely loyal to REI, which he joined in the early 1950s. "The old stores were great, but the new one has got tremendous pizzazz," he says after becoming the first customer to enter when the doors open at 7 A.M.



The enclosed climbing pinnacle tells the world what REI's Seattle superstore is all about. Right: Employee Matt Rudolph, safely belayed, tries a difficult route.

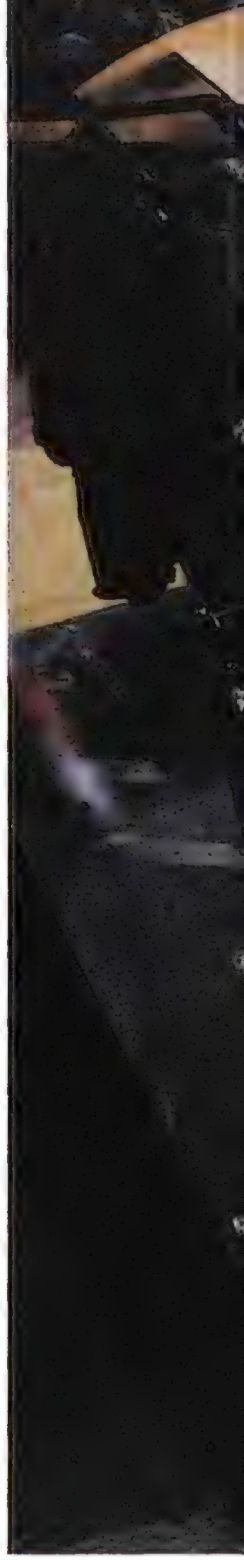
"Pizzazz" is almost an understatement. A waterfall, which drowns out noise from the adjacent freeway, dominates the 21,000 square feet of landscaping around the building. The park-like "grounds" feature native Northwest plants, a walking path and a mountain bike test-riding area. At the southeast corner of the two-story building, which covers an entire city block, stands a 65-foot-high, 110-ton, three-dimensional climbing spire surrounded by glass walls. Exposed laminated beams and steel bracing give an industrial look to the building's interior, softened by an open ceiling that adds a spacious, outdoor feeling. There are two stone fireplaces, before which visitors can rest up from trekking through 80,000 square feet of retail space, as well as an in-store restaurant. Interactive features allow customers to try out equipment under "real-life" conditions. And, oh yes, there's enough outdoor gear to make even gearheads like Bill Biddle drool.

Of course, not everyone shares Biddle's enthusiasm for the new store and REI generally. Some mountaineers complain that because the co-op now sells equipment for so many different sports, it no longer has the variety and depth that serious climbers need. Other folks question the superstore's extravagant cost, wondering if it will dip into their annual co-op dividends. (Since it began, REI has paid out about $240 million to members in annual dividends, two-thirds of that amount just in the past decade, averaging about 10 percent of members' purchases.) Others say REI has sold out to glitzy mall retailing strategies. Bill Hagen, a retired pilot and avid outdoorsman, takes a more measured view: "You hear a lot of older folks grumbling 'It's not the old REI,' but, hell, it hasn't been the old REI for who knows how long."

Success tends to stanch opposition, though, and the flagship store's first year of operation, from every indication, has been remarkably successful. The store became an instant tourist attraction, on a par with the Pike Place Market and the Space Needle. The climbing pinnacle often has a three- or four-hour wait on weekends. Visitors aren't just gawking at the architecture, either. They're shouldering packs, wiggling into tents, trying on the latest fleece fashions—and pulling out their wallets.

Because the number of visitors and the sales volume have surpassed even the company's optimistic projections, industry insiders say the store points the way for outdoor equipment retailing of the future. "I think it's been a big shot in the arm for the outdoor business," says Bob Woodward, who publishes a newsletter for outdoor retailers. "Somebody had to do it. It's taken the business into the modern era."

The first things one touches upon arriving at the new store are, appropriately enough, ice axes. These essential mountaineering tools, used mainly for maintaining balance

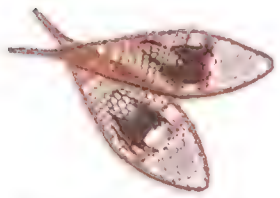


and stopping falls on snow or ice, serve as handles on the towering wood doors. They also played a crucial role in REI's creation.

In 1936 Lloyd Anderson, a member of a small climbing club called the Mountaineers, was unable to find any high-quality, reasonably priced ice axes at local sporting goods stores. So he took the advice of a fellow Mountaineer and ordered one directly from Europe. A cheap yet beautifully made Austrian ax arrived in the mail a few months later. When other club members found out about it, Lloyd gladly started ordering gear for them.

This informal arrangement continued until 1938, when Lloyd and his wife, Mary, decided to make it more official. Because Lloyd was dead set against making money off his friends, he decided not to form a private company. Instead he looked into the idea of starting a cooperative, where members pay a fee to join and then share the profits. Co-ops were popping up everywhere in Seattle's rich, socialist loam of the 1930s, and Lloyd learned about them firsthand from the owner of a neighborhood co-op grocery. Twenty-three Mountaineers paid $1 each to become Recreational Equipment Cooperative's charter members. "We didn't intend to start a business," Mary, now 87, remembers. "We were just buying some stuff for our friends." By the end of 1938, the 82 people who had joined the co-op had purchased $1,361 worth of goods and received $212 back in dividends.

Bob Sutermeister remembers buying his first ice ax and sleeping bag at the co-op during the late 1930s. Now 84, the former Mount Rainier guide stopped hiking just three years ago. During his long tenure in the outdoors, he used to get a kick out of listening to other hikers brag about their low REI numbers. "I've been on hikes," he recalls, "where someone says, 'I'll bet I've got the lowest REI number,' and it's something like 112,342, and I just keep my mouth shut, because I don't want to burst his bubble." Sutermeister was issued card number 35.



FOR THE HANDFUL OF MOUNTAINEERS who shopped at the co-op in the early years, its location inside the office of a downtown Seattle gas station proved handy. While having the tank filled with co-op discounted gasoline, they could purchase a package of dehydrated vegetable mix or a few pitons or carabiners, and be ready to head for the hills. [The antique canteen, snowshoes, candle lantern, climbing boot and piton hammers in the small pictures are part of the collection of gear from those early days which is now at corporate headquarters.]

By 1946, with World War II over, the co-op benefited from all the cheap, high-quality war-surplus gear flooding the market and a booming economy that put cash in people's pockets. That was also the year when the co-op's board of directors finally put the Andersons on the payroll, after they had volunteered their labor for eight years. Lloyd quit his engineering job with Seattle Transit and began stockpiling surplus equipment—jungle packs, down-filled sleeping bags, tents, canteens, C rations, skis, parkas and an avalanche of other gear at discounted prices.

Jim Whittaker, a Seattle climber who had worked for REI since 1955, brought national attention to the co-op in 1963 when he became the first American to reach the summit of Mount Everest. "Big Jim," as he was called, used his mountaineering fame to champion environmental causes on behalf of REI, starting a tradition for the company that continues today. Each year the co-op donates money to groups working to protect public lands. And all the stores recruit volunteers for local conservation projects. When Lloyd Anderson retired in 1970, Whittaker assumed the leadership and started a push to expand the co-op across the nation. In 1975, the

Putting equipment to the test (clockwise, from top left): on the simulated hiking trail, a customer checks the fit of a pair of boots; salesperson Chantel Stanley tries out a waterproof jacket in the Rain Room; bicycle mechanic Kurt Levy fires down a mountain-bike track.

first REI store outside Seattle was opened, in Berkeley, California. Eventually, 49 stores would be built in 20 states all across the country.

With the steady growth came the need for a larger and more sophisticated organization to run the co-op. When Whittaker retired in 1979, the board of directors selected Jerry Horn, a former Sears executive, to replace him. His successor, Wally Smith, began his career at REI in 1965 wrapping mail-order packages as a high school student. He went on to spend his entire working life as an REI employee, rising through the ranks until reaching the CEO spot in 1983, where he remains today.

Corporate headquarters, about 15 miles south of Seattle, is a million miles from the flagship store in character. Inside and out, it has a charmless, no-nonsense feel, with none of the expensive flourishes of, say, Microsoft's headquarters in nearby Redmond. The spartan style makes sense for a co-op, I suppose; members don't want "their" money being spent on frivolities. Workers are dressed casually, with nary a suit or tie in sight.

Not surprisingly, nearly everyone I met who works for REI, whether a corporate bigwig or a store salesperson, has a passion for the outdoors. Carol Momoda, the product manager for footwear, loves to fly-fish and horse pack, as well as ski and bicycle. Matt Hyde, who runs REI's on-line store, says he spends 45 nights a year sleeping under the stars, and has climbed on every continent except Antarctica. Daniel Hardman, an outerwear salesman at the Seattle store, snowboards, rides mountain bikes, runs and does "really pathetic surfing." Quality-assurance manager Kevin Myette is an avid cyclist, in addition to being a climber and backpacker. If you work for Myette, you have to be willing to endure such trials as the annual mountaintop staff meeting. Last year it was held on the summit of Mount Baker, one of Washington State's five volcanoes. Quarterly staff meetings have involved sea kayaking and bicycle tours. After awhile I

Engineer Steve Nagode measures how much force is needed to break the handle of an ice ax.

began to wonder: Doesn't anyone just sit around on weekends watching old movies and eating Cheetos?

Because most of the company's 4,500 employees are active outdoor types, they form a reliable front line of product testers. "We can get products into employees' hands any day of the week going anywhere on the globe," says Myette, who's in charge of making sure prospective products live up to the manufacturer's claims and meet exacting company and industry standards. Employees and a rotating group of volunteer co-op members perform most of the field testing, while an in-house testing lab puts gear through its paces. So great is REI's clout in the industry that some manufacturers, after failing to pass the company's testing, have redesigned their products to win approval.

At the REI Product Testing Laboratory, 20 miles south of corporate headquarters, conversations run to more violent topics: How much force is required to break a particular carabiner or ice ax handle? How much pressure can a metal fuel canister stand before it explodes? "There's a saying we use around here," says Steve Nagode, the mechanical engineer who runs the four-person lab. "If it ain't broke, break it." Like trophies in a hunter's den, a row of bent and broken climbing equipment is proudly displayed on one wall of the lab. Below stands the tensile-strength tester that did the damage; it's capable of exerting up to 10,000 pounds of force. Other instruments of destruction are designed to break, tear or just plain wear out just about any piece of recreational gear you can think of.

Steve Edquist is a 39-year-old camping and climbing gear salesman at the Seattle store. Unlike many people who start low on the totem pole and work up through the ranks, Edquist, who has college degrees in sociology and philosophy, prefers to stay exactly where he is, despite the lower pay. "I really enjoy the one-on-one with customers," he tells me. "It's like a puzzle. You fit in all the pieces of an adventure."

I ask Edquist, a ten-year REI veteran, what he likes best about working for the company. "You mean besides playing with all the neat toys?" he quickly answers, referring to the company's product-testing system, the deals offered by manufacturers and the 30 percent discount employees receive on gear. He thinks for a moment and continues. "It's the people who work here. These are totally the most eclectic group of people you can imagine. If you want to go boardsailing, you go around and ask if anybody wants to go. If you want to ski, you can usually find someone to ski with, or to climb with." Although you couldn't actually call it an employee benefit, Edquist also met his wife-to-be seven years ago while both were working at the old Seattle store.

So what does a guy who works all week in the camping equipment department do on his weekends and vacations? You guessed it. Depending on the weather, you'll find him backpacking, mountain climbing, skiing, fly-fishing, cycling or leading backpacking trips for REI Adventures, the co-op's travel division. "It's sort of a renaissance approach," he says, almost apologetically. "I guess that's why I never really got into the upper end of rock climbing. You have to really dedicate yourself to rock climbing to get good at it."

Edquist works every day next to REI's vaunted climbing pinnacle and gets to practice climbing it in the mornings before the store opens, yet he still speaks in respectful tones about its more difficult pitches. The way he talks about it both scares me and makes me want to try climbing it myself, and I decide to give it a shot.

ON WEEKENDS AND HOLIDAYS, WOULD-BE climbers line up outside the store before it opens, so they can rush in and put their names on the waiting list. Once you're on the list, you're given a pager that vibrates silently when it's time for you to climb. On the day I climbed, the wait was only an hour long. As I took my time wandering from the boot department down to the pinnacle, I comforted myself with the knowledge that I'd seen lots of kids scale the more elementary of the pinnacle's 15 routes. I was also reassured by the fact that climbers are tied to the belay rope in such a way that if you lose your grip on the rock, you fall just a few inches before the rope stops you.

A young fellow named Chris, after securing the belay rope to my harness with a figure-eight knot, escorted me to the bottom of the route I'd chosen, a moderately easy climb that would afford a panoramic view from the top. Being tall and somewhat agile, I had no trouble ascending the first 20 feet or so. But about halfway up, unable to resist the temptation to look down, I felt my palms turn sweaty and my heart go thumping against my rib cage. I kept going, though, focusing on each placement of feet and hands. Reaching the 65-foot-high peak a few minutes later, I looked out through the windows for the first time.

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Joshua Rebol sets up a special-order $5,000 bike made of titanium, which gives it more flexibility and better suspension.

Near the climbing pinnacle are two of the store's other "interactive" features. A dozen handheld water purifiers lie along the shore of a small pool, their hoses dangling in stagnant water. You can pump their handles to see if the $295 Swiss-made Katadyn is any easier to use than the $60 Sweet-Water Guardian. Old-timers can only shake their heads at the sight, thinking back to the days when glacier-cold water was thought safe enough to drink right from the creek. Nearby, a stainless-steel vent hood rises upward from a platform where cookstoves can be fired up for testing. Alas, none of the venerable, beautifully crafted Optimus stoves from Scandinavia, their designs little changed in the 100-odd years since they were invented, are represented anymore. They've been supplanted by newer, lighter and more fuel-efficient models made by Mountain Safety Research, a company REI owns.

WHEN IT COMES TO ACQUISITIVENESS, I guess I'm no different from most long-time customers; in other words, yes, I admit to a weakness for collecting gear. If I could afford to, I'd be right there with guys like Bill Biddle, filling house after house to the rafters with outdoor equipment. During several visits to the store, I had to force myself to resist many of the products I explored, especially on the first floor, where most of the "hard goods" are displayed: gear for bicycling, skiing, kayaking, camping, hiking and climbing. ("Soft goods"—apparel and footwear—take up most of the second floor.) Because it carries 40 percent more product lines than a typical REI store, and in keeping with its role as a "corporate lab," the new store is the perfect place to ogle the sort of arcane gear you'd normally find only in the product-review section of outdoor magazines.

One product that caught my eye was a GPS (Global Positioning System) unit, a lightweight, handheld device that uses satellite signals to determine one's location anywhere on earth. In the early 1970s the U.S. Government began launching a $13 billion system of 25 satellites into stationary orbits around the globe. Like a fixed constellation of stars, the satellites continually transmit signals to earth. When the transmissions from at least four satellites are received, a GPS receiver can triangulate a person's location. Since the government began allowing civilians to use this technology, GPS units have become enormously popular among hunters, campers, boaters and other outdoor enthusiasts. The price of the model I looked at was only $150, almost low enough to entice me to buy.

Relying on my Scottish genes to pull myself away from the counter, I proceeded up to the second floor. Here shoppers can sort through more than 350 models of outdoor footwear, many displayed on the wall. A pair of a new generation of hiking boots beckoned me to try them on. To check for proper fit in most outdoor shops, you can only stand on a tiny ramp, to see if your toes hit the end, or walk the floors. But the new REI store has a large, angled boot-testing path whose cobbles and undulating surface mimic trail conditions. The only problem is that boot testers usually have to compete with kids who are attracted to the fake

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trail as to a schoolyard playground.

In the outerwear section, the glass-enclosed Rain Room duplicates typical Northwest weather. I felt like a fish entering a giant aquarium as I stepped inside wrapped in a rain jacket. When the drizzle started falling, passersby smiled and gawked. A minute passed. Yes, my lovely Gore-Tex jacket beaded up with moisture, and I could feel no leaks. But then I thought, it's March, we've had one of the wettest winters on record, and I'm choosing to stand beneath simulated rainfall? That's when I signaled the salesman to stop the rain and let me out. The Rain Room, I learned, has inspired all sorts of suggestions, some seriously considered, others not. One is a Cold Room for trying out sleeping bags and insulated jackets. Another is a Mosquito Room for testing insect repellent. Jerry Chevassus, REI's director of retailing, shudders at the ramifications of the latter.

The company decided to install interactive areas in the new store for several reasons. Their entertainment value is obvious; they lure the curious and pump up enthusiasm for outdoor pursuits. But REI prefers to think of them as primarily educational tools. "We sell technical equipment; that's our reputation," Chevassus explains. "We wanted to demystify some of that technical-ness. To do that we wanted to get the product out of the box and into customers' hands." Chris Doyle, public relations administrator, adds that the interactive features "lower the bar for people to try new activities."

The company benefits from manufacturing about 30 percent of the goods it sells, which have a higher profit margin than items made by other companies. (About half are made in the United States and half in Asia.) REI and other outdoor retailers have also reaped a windfall from the continuing trendiness of the "outdoor look," which began in the 1980s. According to David Secunda, head of an outdoor recreation industry trade group, the highly profitable apparel and footwear sectors made up 65 percent of sales in the overall $4.7 billion outdoor-recreation market in the United States in 1996. (Soft goods make up a little more than 50 percent of REI's overall sales.)

It doesn't seem to matter if someone actually participates in the sports these days; the important thing is to look the part. Bob Woodward, the outdoor equipment newsletter publisher, calls these people the "wannabes," a huge new market that has emerged in the past several years. "What I mean by the wannabe market," Woodward said, "is people who buy an expensive mountain bike and use it once a year, or people who wear 'extreme' gear to drive their sport utility vehicles to the shopping center."

Mary and Lloyd Anderson started the whole thing 60 years ago as a favor to fellow climbers. They never dreamed what REI would grow to be.

If the wannabes just stayed in the city, there would be no problems. But many of them want to try their luck outdoors. "They go to REI or EMS [Eastern Mountain Sports, another major outdoor equipment retailer] and outfit themselves," said Tim Cochrane, president of the Mountain Rescue Association, "and after a two-hour Interstate drive, they're at the edge of a wilderness area. These guys often don't have any training, and in just five minutes off the highway they can get into trouble."

Curiosity and a longstanding desire to climb Washington's tallest peak prompted me to check out the "Preparing for Mount Rainier" seminar. It was given by Steve Edquist, the climbing department salesman. In a tricky maneuver, he managed to impress upon the hundred or so of us that climbing Rainier would probably be one of the toughest feats we will ever have done, yet his stories and useful tips left me, and most of my companions, jazzed about trying it.

DURING THEIR YEARS AT THE HELM OF REI, Lloyd and Mary Anderson rarely had to deal with consumer education, or with the mind-boggling assortment of expensive, highly technical equipment that saturates the outdoor market today. Since Lloyd left the board of directors in 1975, the Andersons have had little to do with REI, preferring to live a quiet life in the bungalow that they built in the early 1930s. Over the years they have seldom even visited an REI store. They did, however, attend the big invitation-only party at the new store the night before the opening. Although horrified at the high prices of modern gear and amazed that REI operates 49 stores, Mary is careful not to criticize the new paths the company is forging.

"I consider that they're living in a different age, they're meeting a challenge we never faced," she says. "They're doing things that I might not be very enthusiastic about, but so what? Wally Smith called me and said that they were putting a time capsule underneath that thing they call a climbing rock and it's to be opened in 50 years, and did I want to put something in it? And I said, 'Oh Wally, no, it's your store now.'"

Scott McCredie, who is based in Seattle, last wrote on tsunamis (March 1994). Regis Lefebure's photographs of Alcatraz (September 1995) have won five awards for SMITHSONIAN.

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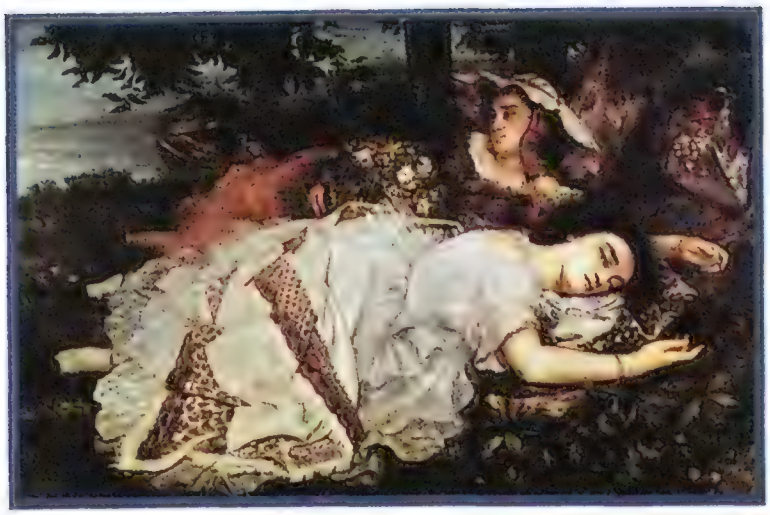
Picasso
takes on the masters



A BOOK BY SUSAN GALASSI EXPLAINS WHY THE ARTIST WITH AN EYE ON THE FUTURE KEPT RETURNING TO THE ART OF THE PAST

Gustave Courbet, whose provocative *Young Ladies on the Banks of the Seine* (left) shocked the public when it was exhibited at the Salon of 1857, was, for Picasso, a model of an innovative artist. In his 1950 variation on the painting (below), Picasso makes linear patterns of Courbet's painterly drapery, while still emphasizing the earlier artist's use of thickly applied paint.

"The painter takes whatever it is and destroys it. At the same time, he gives it another life."

—Pablo Picasso

MUSEU PICASSO, BARCELONA; SCALA/ART RESOURCE; PP. 114,115, TOP: GIRAUDON/ART RESOURCE; OFFENTLICHE KUNSTSAMMLUNG BASEL, MARTIN BÜHLER

"When I paint I feel that all the artists of the past are behind me."

—Pablo Picasso

"A PAINTER'S ATELIER SHOULD BE a laboratory," said Pablo Picasso in 1945. "One doesn't do a monkey's job here: one invents." Picasso, the inventor of whole new systems of painting for the 20th century, never aped the accomplishments of past masters. Yet throughout his career he explored issues of style, structure and meaning by creating variations of works by other artists.

These explorations are the subject of a book by Susan Galassi, associate curator of the Frick Collection in New York and a Picasso scholar. Published by Harry N. Abrams, *Picasso's Variations on the Masters: Confrontations with the Past* documents the artist's lifelong use of his predecessors' work as a spark for his own creative processes, and as a way of demonstrating his own place in the tradition of European art.

In his early years, Picasso's occasional variations were fueled by a sense of competition with past artists. In *Odalisque, After Ingres* (1907-08), for example, Picasso translates the reclining nude in Ingres's *Grand Odalisque* into his own Cubist style, taking Ingres's subtle distortions of the figure several degrees further (p. 120). Many of the variations are infused with the artist's sense of humor; in a parody of Manet's *Olympia*, Picasso inserts a portrait of himself into the scene in the role of the courtesan's client.

In 1957, at age 76, Picasso spent four intense months producing 45 variations of Velázquez's masterpiece *Las Meninas* from 1656. These works, Galassi points out, are a "process of continuous transformation." This transformation is most visible in the 14 works that focus on the central character of Velázquez's painting, the young Spanish princess. She appears in some as a series of refined Cubist abstractions and in another as a glow of expressionist energy; in a more naturalistic version the artist gives her the features of his daughter Paloma. In Picasso's mind there was no more truth in the last painting than the first; for him creativity involved constant change. "A picture," he had said to a friend in 1935, "lives a life like a living creature, undergoing the changes imposed on us by our life from day to day."

Picasso's work remains extremely popular. "I think we've stayed interested in Picasso because his work encompasses so much of the past," says Galassi. "Although he set up a whole new concept of art for the 20th century, he was working within the context of art history. The dialogue was always there." —*Alison McLean*

Picasso painted 45 variations of Velázquez's 1656 masterpiece *Las Meninas* (bottom, left). In one variation (top, left) the figures are swallowed by the pattern of the space around them; in another (above) the princess grasps the disembodied hand of her maid.

"What I really like about El Greco are his portraits, these gentlemen with their pointed beards."

—Pablo Picasso

In his *Portrait of a Painter, after El Greco,* from 1950 (above), Picasso transforms the direct gaze of the painter in El Greco's portrait of his son (left); Picasso's painter, whose profile is superimposed on his frontal face, could only have Cubist vision.

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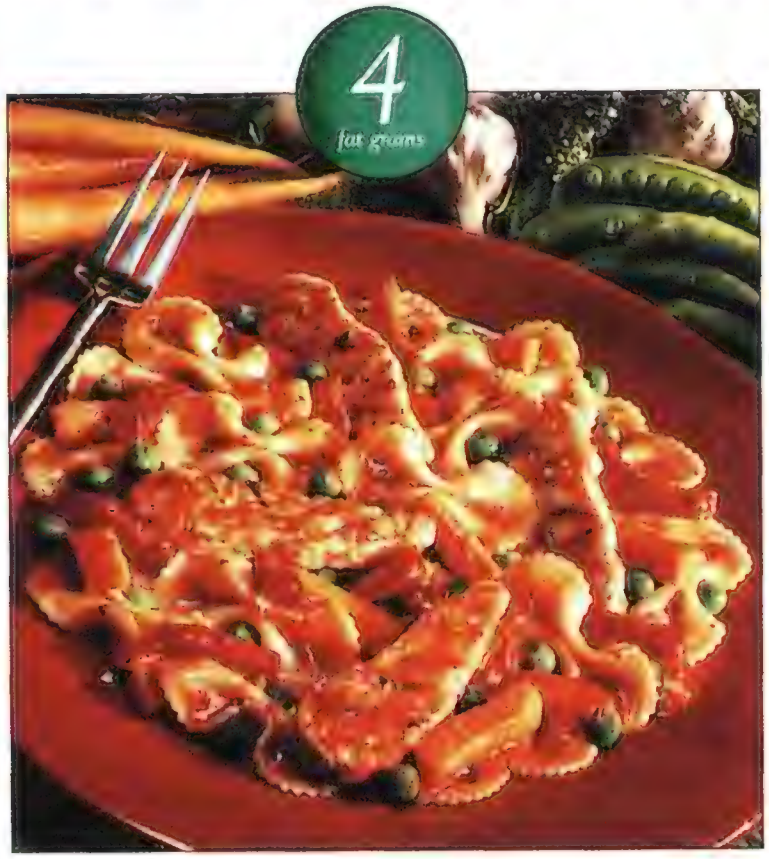

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"Cubism is no different from any other school of painting. The same principles and the same elements are common to all."

—Pablo Picasso

Picasso was fascinated by the work of the French Neoclassical artist Jean-Auguste-Dominique Ingres. In *Odalisque, After Ingres* (top), an early variation done in 1907 when he was 26, Picasso ignores the face and character of the woman in Ingres's *Grand Odalisque* (above), concentrating instead on defining her structure and surroundings, using the Cubist style that he had recently developed.

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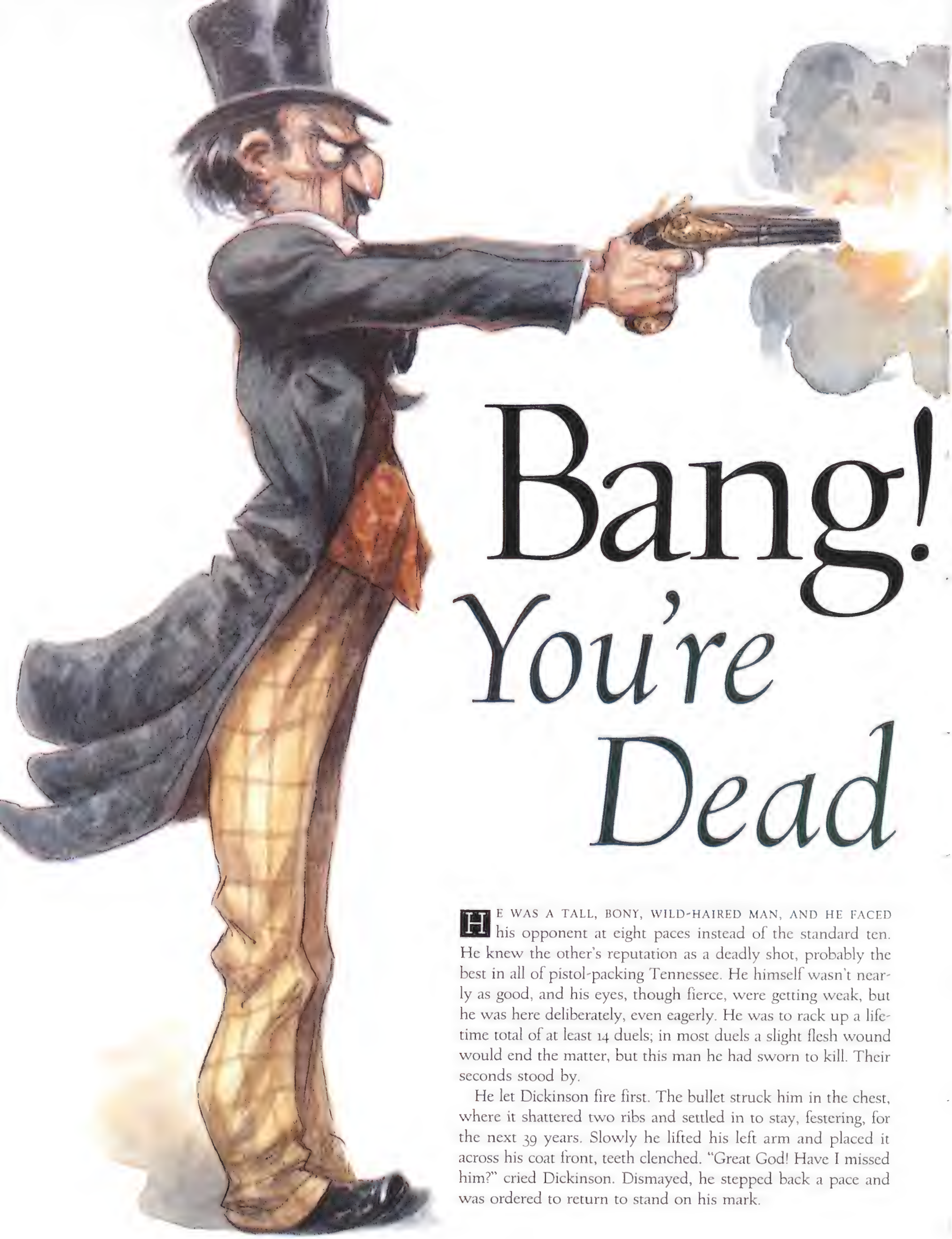

Bang! You're Dead

HE WAS A TALL, BONY, WILD-HAIRED MAN, AND HE FACED his opponent at eight paces instead of the standard ten. He knew the other's reputation as a deadly shot, probably the best in all of pistol-packing Tennessee. He himself wasn't nearly as good, and his eyes, though fierce, were getting weak, but he was here deliberately, even eagerly. He was to rack up a lifetime total of at least 14 duels; in most duels a slight flesh wound would end the matter, but this man he had sworn to kill. Their seconds stood by.

He let Dickinson fire first. The bullet struck him in the chest, where it shattered two ribs and settled in to stay, festering, for the next 39 years. Slowly he lifted his left arm and placed it across his coat front, teeth clenched. "Great God! Have I missed him?" cried Dickinson. Dismayed, he stepped back a pace and was ordered to return to stand on his mark.

Bang!

BY BARBARA HOLLAND

DUELING AT THE DROP OF A HAT WAS AS EUROPEAN AS TRUFFLES AND AS AMERICAN AS MOM'S APPLE PIE

ILLUSTRATIONS BY PETER DE SÈVE

Blood ran into our hero's shoes. He raised his pistol and took aim. The hammer stuck at half cock. Coolly he drew it back, aimed again, and fired. Dickinson fell, the bullet having passed clear through him, and died shortly afterward.

"I should have hit him," our bleeding hero said, "if he had shot me through the brain."

A costume melodrama in glorious Technicolor from the archives of MGM? A paperback swashbuckler at the airport newsstand? Well, no. The year was 1806 and the survivor was Andrew Jackson, later our widely beloved seventh President, just doing what any gentleman would do. The spat had begun when Dickinson took the "sacred name" of Jackson's wife, Rachel, into his "polluted mouth" and escalated in an argument over a horse-racing debt until death was the only answer.

Americans like to think of dueling as antique, elitist and pure-

Duels impressed fair ladies and one's peers. And they looked good on the résumé.

ly European. Not our kind of thing at all. Our historians and biographers ignore gentlemanly dueling as much as possible, though the historic air is blue with accounts of rude Western types plugging each other in places like Dodge City. Only one formal American duel can't be politely overlooked in our textbooks; such schoolchildren as still learn history learn that Aaron Burr shot and killed Alexander Hamilton. When they do, they're shocked. Accustomed as they are to random murders, the formality of the occasion and the importance of the players seem alarming. How was it possible that after the duel Burr went not to prison but back to Washington, D.C. to resume his presidency of the United States Senate?

Many confuse Burr with the likes of John Wilkes Booth: assassins both. Nobody tells the children that the Burr-Hamilton matter (SMITHSONIAN, November 1976) wasn't a uniquely gruesome crime but quite an ordinary event. Or that affairs of the kind were faithful to an ancient code of honorable behavior and, by the 19th century, so characteristic of American political and journalistic life that the Rev. Lyman Beecher, father of Henry Ward and Harriet, once cried out, "We are murderers, a nation of murderers." Nobody mentions that Hamilton, not quite the textbook's martyred innocent, had been a principal in 11 previous affairs of honor, mostly aborted, including clashes with the abrasive John Adams and the otherwise easygoing James Monroe; or that Hamilton's son Philip was killed in a duel.

We'd like to forget that only in recent times has American umbrage mutated into highway wars in which rival commuters run each other's cars off the road, or into lesser rituals like libel suits in which honor is restored by cash instead of blood.

Scholars suppose that dueling took root with the most primitive judicial systems, when disputes insoluble by witness testimony were solved in a trial by combat. The lower classes bashed each other with cudgels and staves in their customary fashion; the gentry used more gentrified weapons. On the hazy theory that God identified the good guy and lent him a hand, the winner, whether he did his own fighting or hired a proxy, was more than just the winner. By the fact of winning he was held to be innocent of the charges brought; he was honest, and the defeated man a liar; the disputed land, or ox, or fair maiden was rightfully his.

The ritual battle moved out of the courts and into the world. Gallant knights in heavy armor challenged fellow knights according to an established code, making the welkin ring with sword blows. In spite of periodic bannings, personal combat spread. It appealed to young aristocrats with too much time on their hands. Landowners laid out and leased special dueling sites, complete with bleachers for onlookers. In France, the judicial trial by combat was officially abolished in 1385—and was occasionally unabolished in the centuries to come. Queen Elizabeth I squashed it in England about 1570. Yet the private duel of honor, which was sometimes graciously attended by the reigning monarch, was just hitting its stride.

Young men from all over Europe slipped off to Italy to learn the art of fencing at the flourishing schools there. It was in Italy that the first essential manual on dueling, *Flos duellatorum*, was published in 1410, and every medieval gentleman studied it closely. Traveling fencing masters spread out and founded their own schools. By 1480 in Germany such schools, called *Fechtschulen*, enjoyed privileges conferred by the emperor himself, establishing a tradition beloved by the military and students in dueling clubs until well into the 20th century—perhaps, it's hinted, even today.

In 1527 Charles V, overlord of the Holy Roman Empire, declared that Francis I of France had broken a treaty and was, as Charles would have it, "a stranger to honor and integrity becoming a gentleman." Francis challenged him. Charles accepted. Their duel, like so many, fizzled away in preliminary negotiations. It was finally canceled, but news of the plans between the two most powerful men in Europe sparked fresh enthusiasm all over the continent. Dueling was plainly the socially correct thing to do.

Battles of honor with various sharp instruments became a favorite pastime in England, Scotland, Spain, Italy, Austria and Germany. For Irish laddies, dueling became an essential rite of passage. In France, swordplay developed into such an obsession that Henry IV was alarmed enough to outlaw it in 1599. His subjects paid no attention. Even though an apology or a few drops of blood often ended such matters, it has been claimed that during a peak 180-year period, 40,000 Frenchmen died of dueling wounds. The figure does not

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seem so preposterous when you learn that in just one decade under Henry IV, as many as 6,000 dueling deaths occurred. Even women joined in. In 1721, a Lady de Nestle met the Countess de Polignac with pistols in the gardens of Versailles over the handsome Duc de Richelieu. Their first shots went wild, but in the second round de Nestle was badly wounded. In the reign of Louis XIV, Madame de St. Belmont, dressed as a man, met a cavalry officer on the designated field and promptly disarmed him with her sword. It is by no coincidence that the Three Musketeers, who never parted from their swords, are French national heroes—along with Cyrano de Bergerac who outpointed 100 assailants at a time, presumably while composing and reciting his own verse.

By the 1700s dueling textbooks were less concerned with the fine points of swordplay than with the fine points of personal honor, the etiquette involved in exactly when a challenge was required, how to deliver it, how to accept it, and how to emerge, dead or alive, washed clean of the disrespectful look, word or gesture. The semiofficial Code Duello was adopted in Ireland in 1777 and spread rapidly. Its 36 rules laid out the proper conditions for upper-class combat, the wording of challenges, and the right of the challenged to choose the place and weapons. The rules were paramount; if they were broken, it wasn't a duel at all, merely an unseemly brawl.

The rules of swordplay had long been established, but when guns took over the field, the seconds had more leeway in negotiating matters like distance, the number of shots to be fired, and when. Sometimes a second would call "Ready?" and the duelists, back-to-back, their weapons at their sides, would march forward to the count of paces, wheel and fire. More usually, the seconds measured off the distance and drew their marks. The principals often stood sideways to each other, sucking in their stomachs to narrow the target. One of the seconds counted, "Fire, one, two, three"; it was bad form to fire before "one" or after "three."

Only another gentleman could meet a gentleman. If a churl insulted a gentleman, the gentleman might have him flogged, but there was no way he could honorably avenge himself face-to-face. Not that it mattered: a peasant's insult was no insult at all. Among the elite, however slight a slight might be, it could not decently go unchallenged and no challenge could decently go unmet.

A Mississippi sandbar was favored as a dueling ground in part because it was convenient for citizens to row over and watch.

Like bungee jumping, rock climbing and other dangerous customs, duels were popular because they were exciting. They offered the restless young an outlet for natural aggressions. With this in mind when he ran for mayor of New York, Norman Mailer called for real jousting in Central Park. Duels spiked the testosterone; they provided the heady rush of risk without the large-scale cost and inconvenience of going to war. They impressed fair ladies. They impressed one's peers. They impressed those who might grant advancement at court or in the military, illegal or not. In short, they looked good on the résumé.

Alexandre Dumas (SMITHSONIAN, July 1996), writing in the mid-19th century of the glory days of the 17th, gave the world the merrily fearless Athos, Porthos, Aramis and d'Artagnan, parents of dozens of rousing movies. (One of Dumas's Musketeers at least was based on a real firebrand, Armand de Sillègue, Lord of Athos, who died by the sword in 1643.) As the

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Their first shots went wild, but in the second round Lady de Nestle was badly wounded.

young hero, d'Artagnan, sets forth to seek his fortune, his father lectures him: ". . . never tolerate the slightest affront from anyone except the cardinal or the king. . . . Fight duels at the drop of a hat, especially since duels are forbidden: that means it takes twice as much courage to fight one."

Who could resist?

Duel-wise, America hit the ground running. The ink of his signature on the Declaration of Independence was barely dry before the brilliant Button Gwinnett was killed at 12 paces by Gen. Lachlan McIntosh, of the battling McIntosh clan, in a matter concerning a Colonial appointment.

By this time pairs of dueling pistols had come into their own as specialized weapons, elegant and, for their day, accurate. The earliest were made in England, and Americans ordered them from there until makers like Constable of Philadelphia and Cooper of New York were producing their own. Usually about .50 caliber, exquisitely engraved and housed in velvet-lined mahogany boxes with their own cleaning rods and accessories, they became a distinguished element in any gentleman's haberdashery.

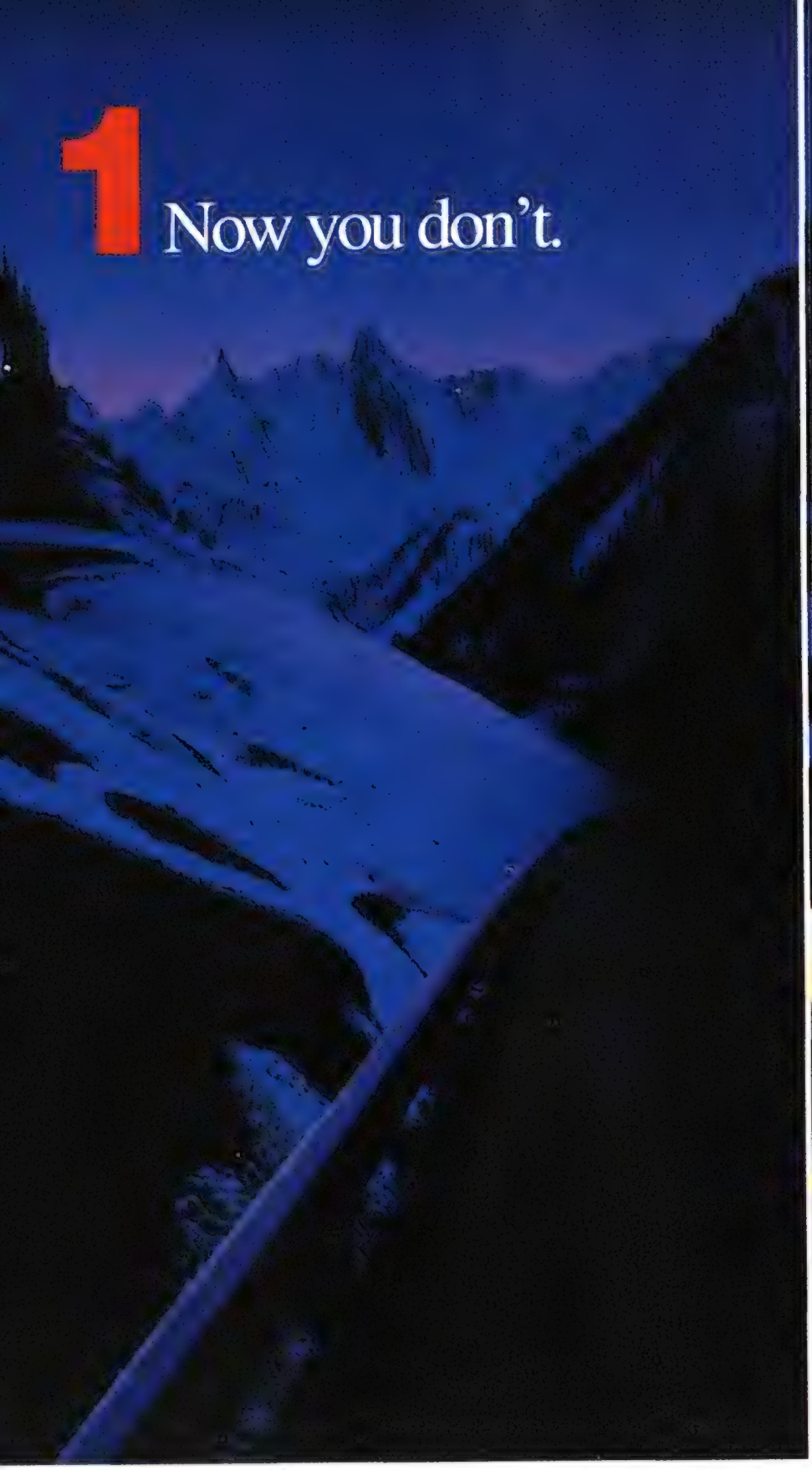
Until the 1830s, many were fitted with hair triggers, requiring only the most tentative touch. A man who, through nerves or inexperience, touched too soon would shoot a tree or the ground, depending on whether his arm was falling or rising. But for less ham-handed duelists, the hair trigger allowed not only a faster shot but a more accurate one, too.

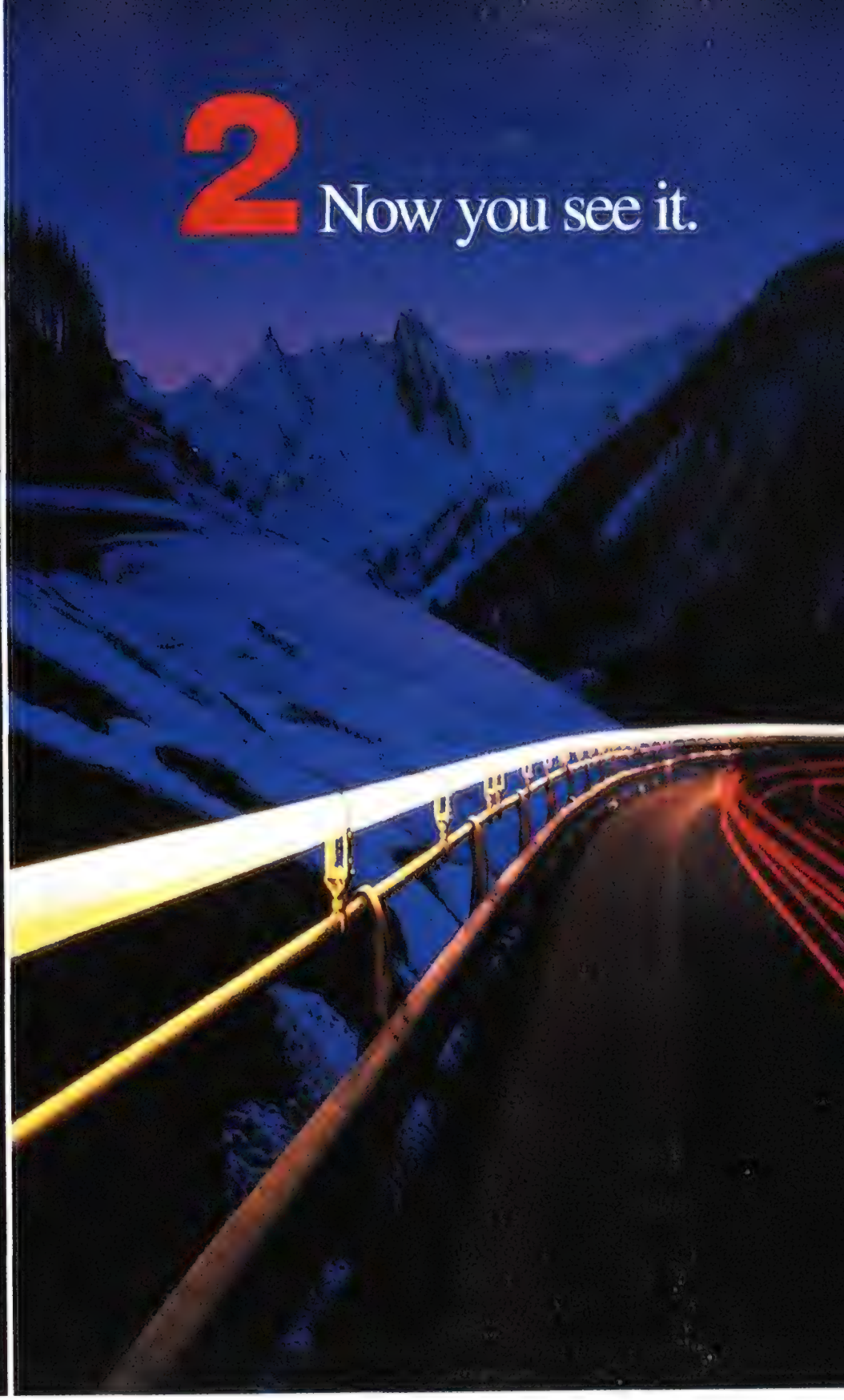
Hair triggers fell into disrepute, but speed and accuracy continued to improve, particularly for shooting at greater distances. (In 1834 Alexander McClung, inveterate Southern duelist, set a new record by fatally shooting his man in the mouth with a percussion pistol at over a hundred feet.)

Like so much of our Old World baggage, the duel underwent a sea change in crossing the Atlantic. Here, fair maidens and a gentleman's honor soon became less of a problem than politics. The new country took its politics to heart; almost from the beginning of the Republic all political factions considered all other political factions a threat to the country and a personal insult. They called each other not just traditional things like "liar," "coward," "puppy" and "poltroon," but "fornicator," "madman" and "bastard"; they accused each other of incest, treason and consorting with the Devil. Political debate often led straight to whatever secluded local spot had been set aside to soak up the blood of satisfaction.

It was political suicide to suffer an affront without challenging, or to decline a challenge. Such things had a way of getting around, by way of dinner parties, pseudonymous newspaper articles or the purely American custom, popular clear into the 1890s, of "posting" in taverns and on street corners notices that called the coward a coward. (Posting was also a common way of issuing a challenge in the first place.) Obeying the code of honor showcased a man's courage, integrity and conviction, and marked him as leadership material. It was a wise career move. One James Jackson, at the tender age of 23, killed the lieutenant governor of Georgia for his "overbearing" manners and went on to become governor himself, as well as congressman and senator. Hamilton, explaining his acceptance of the Burr duel, wrote, "The ability to be in future useful, whether in resisting mischief or effecting good . . . would probably be inseparable from a conformity with public prejudice in this particular." A pompous way of saying nobody would vote for or listen to a poltroon.

Judges, governors, senators, congressmen and rival candidates for office blazed or slashed away at each other. From 1795 until 1800, Federalists dueled with Republicans. After Jefferson's election, Clintonian (so named for New York's first governor, George Clinton) Republicans battled Burrite Republicans, and then went back to shooting Federalists. Decades later, when Andrew Jackson was polarizing the American political scene, an anti-Jacksonian, Col. Robert Crittenden, shot Jacksonian general Henry Conway through the heart.





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The following year on Bloody Island, a favorite dueling site near St. Louis, Congressman Spencer Pettis, who was running for reelection from Missouri, and Army Postmaster Maj. Thomas Biddle, who had called Pettis "a bowl of skimmed milk," killed each other at the brutal distance of five feet. Among many encounters in the corridors of power, Congressman Jonathan Cilley of Maine and Congressman William Graves of Kentucky had a falling out over a newspaper article and chose rifles at 80 paces; Cilley died.

From the 1830s on, in the territories and border states, proslavery and abolitionist hotheads challenged each other regularly. In California in 1859 the former chief justice of the state supreme court, proslavery judge David Terry, killed antislavery senator David Broderick before a large crowd of fascinated spectators. In the South, being called an abolitionist was added to the list of insults that required a challenge.

Edgar Allan Poe challenged one of the paper's editors but showed up too drunk to shoot.

Policy differences rankled for years. Having disagreed about the War of 1812, and most other matters since, in 1826 U.S. Secretary of State Henry Clay and Senator John Randolph of Virginia finally met by appointment across the Potomac from Washington. Randolph showed up in a long flannel dressing gown. (Considered eccentric if not downright deranged, he had reportedly fought his first duel in college over the pronunciation of a word.) The rendezvous with Clay was a distinguished encounter, though not quite historic, since the statesmen narrowly missed each other. Then they shook hands and (more or less) made up. A good duel could be cleansing.

Political honor hung by threads as slender as mail delivery. In the 1820s when Sam Houston was a congressman from Tennessee, he mailed his constituents some packets of vegetable seeds to plant. They were never delivered, and Houston called Nashville postmaster Curry a scoundrel. Curry sent a general named White with a challenge. Houston said he wouldn't fight such a lowlife as Curry, so White offered himself instead. They fired at each other from 15 feet, and Houston wounded White severely in the groin. Nobody knows whether the seeds ever turned up.

Even Abraham Lincoln, that tower of common sense, was not a complete stranger to the field of honor. He'd objected to the tax policies of Illinois state auditor James Shields and wrote a piece signed "Rebecca," calling Shields a fool, a liar, and smelly to boot. Shields sent a friend storming into the newspaper office, demanding to know Rebecca's true identity. (People frequently stormed into newspaper offices in the 19th century, often heavily armed; pressrooms kept a loaded gun handy.) The editor quickly exposed his source. Shields challenged Lincoln.

According to one version, Lincoln accepted, choosing cavalry sabers, presumably because of his famously long arms. Everyone showed up as planned on a sandbar in the Mississippi near Alton, Illinois. Honest Abe sat on a log idly swishing his saber around in the air, suggestively slashing the branches high above his head, while the seconds, whose duty it was to try to mend matters, conferred. Presently a statement was agreed on, in which Lincoln was said to have said he hadn't meant anything personal in the article, including, apparently, how Shields smelled. Then everyone went home.

Naturally newspapers and their editors were always in the thick of the dueling scene, fanning the flames. The notion of impartial political reporting would have been laughable; a newspaper was a partisan organ, fiercely praising its faction and calling its opponents monsters, consummate traitors and contemptible scoundrels. When the editors' invention flagged, contributors pitched in, signing their pieces with noms de plume like "Vindix" or "Democritus." A politician who couldn't find a paper to wave his banner was forced to start a paper of his own.

Opposing editors put on their pistols when they dressed in the morning. Challenges rained down on their heads. Pressed for time, one 19th-century San Francisco editor posted a notice on his door, "Subscriptions received from 9 to 4, challenges from 11 to 12 only." In Vicksburg, Mississippi (est. pop. 3,500), three newspaper editors died in duels in 1843 and the early part of 1844. In hot-blooded New Orleans, Dr. Thomas Hunt, perceiving slurs on his family name, killed John Frost, editor of the *Crescent*. In Kentucky, the proslavery Charles Wickliffe killed the editor of the Lexington

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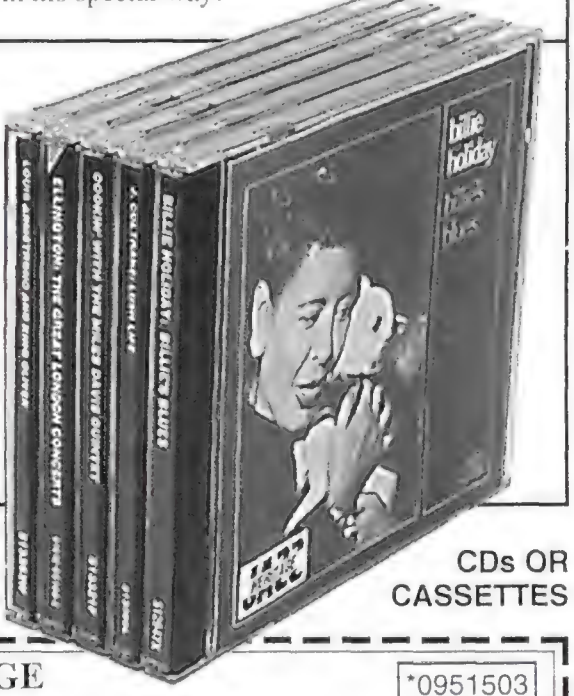

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Gazette over an anonymous dissenting article. He was tried and acquitted, but the succeeding editor, George Trotter, disagreed with the verdict in print. Wickliffe challenged him and was killed at eight feet.

Virginia editors had a particularly short shelf life. The two brothers who edited the Richmond *Examiner* in the early 19th century both died in duels. Edgar Allan Poe challenged one of the paper's later editors but showed up too drunk to shoot. Before the Civil War, O. Jennings Wise, editor of the Richmond *Enquirer*, fought eight duels in only two years. John Daniel of the *Examiner* disagreed with Edward Johnston of the *Whig* over the esthetic merits of a particular statue. In the inevitable duel, they both missed.

As the duel went West it lost some of its classic formality, and sometimes instead of the courtly letter of challenge delivered by a dignified second, a glass of whiskey thrown in the face would suffice. It flourished, however, especially in California, where in 1852 a dispute over whether or not to send aid to the snowbound Donner Party led Gen. James Denver, Secretary of State of California, to kill Edward Gilbert, editor of the *Alta California*. (This proved a good career move; Denver, untainted, went on to serve as congressman and territorial governor, and had a city in Colorado named in his honor.)

Many Westerners didn't own dueling pistols and used what they did have, homelier weapons, including the wicked bowie knife that could slice off a man's nose like butter. In Denver versus Gilbert, the weapons were rifles at murderously close range. (With rifles, if your weapon misfired you were in deep trouble.) Around the same time and place Charles Lippincott, editor of the *Sierra Citizen*, killed a lawyer named Tevis in a duel with double-barreled shotguns loaded with ball at 40 yards. The effect was quite gruesome.

Even as late as mid-century there were few laws against dueling, and where such laws existed they proved hard to enforce, harder to prosecute and hardest to explain to a jury. Dueling was still considered, even by the federal lawmakers, as the mark of a manly and vigorous society and necessary to keep rude tongues in check. In 1838 Congress did make it illegal to offer or accept a challenge within the District of Columbia, but that same year Gov. John Wilson of South Carolina issued his 16-page pamphlet revising and updating the Code Duello for American use, even softening the European prejudice against fighting one's social inferiors. It was a big seller, regularly reprinted for years.

By 1859, eighteen states had banned dueling, with little perceptible effect. Indignant duelists—with their seconds, attending physicians and sometimes crowds of onlookers in tow—continued to troop out of town or across a state border or simply into a grove of trees to settle their differences. New Yorkers slipped across the river to New Jersey, to Hoboken or to Weehawken, where Hamilton met Burr. The dueling doctors of New Orleans repaired, like all the bloods of that mettlesome town, to a grove known as "The Oaks" to settle medical matters—surgical methods, purges, poultices and the proper treatment of typhoid—with sword and pistol.

Islands and sandbars were popular because of their ambiguous jurisdiction. Richmond duelists headed for Belle Isle in the James River. Vidalia, in the Mississippi, was favored in Natchez, in part because it was convenient for the citizens to row over and watch. Bloody Island served St. Louis. Memphis

duelists often crossed the river to Arkansas to fight, while farther south, Arkansans repaired to the mouth of the White River in Mississippi. Mid-river, on a paddle-wheel steamer, was another oasis, and James Bowie killed a gambler in a duel over a card game aboard the *Orleans*.

Most famous of all was the more-or-less-official national dueling ground in Bladensburg, Maryland, a convenient mile or so beyond the District of Columbia line. Here, on 15 vine-choked acres, a hundred or more duels were fought. It has been described as "the court of last resort, in which weighty points of etiquette, social and political problems and questions of veracity, propriety and right were expounded by the convincing power of gunpowder." It was here that Gen. Armistead Mason died by a shotgun slug from his cousin, Col. John McCarty. It was here that Commodore Stephen Decatur, a brave and dashing officer, fell.

The Navy had long treasured its dueling tradition; a copy of the Code Duello was in every midshipman's handbook, and until the Civil War no niggling official rules hampered naval dueling. In 1808 Decatur sat on the court-martial board that suspended Capt. James Barron, in effect, for mishandling a confrontation with the British Navy, and Barron went abroad to brood. Decatur became the wildly popular hero of the War of 1812 and coiner of the phrase "Our country, right or wrong." When Barron came back and asked to be reinstated, Decatur opposed him. Barron called him out, and they met at Bladensburg, eight paces apart. Decatur, 41 years old and by all accounts as sweet-natured as he was brave, died that night; Barron lived to be 89.

Around 1857 Bladensburg's bloody ground was cleared, plowed and planted. Dueling, however, fueled by the passions of the impending Civil War, was hardly deterred. Indeed, the Civil War itself, and the Southern response to it, sometimes seems more an affair of honor than a war, involving what might be called collective personal pride more than common sense or public advantage.

The temper of the country was shifting, however. By war's end, enough blood had been shed to give many a distaste for the deliberate gore of dueling. Public opinion, the only effective court, changed, and anti-dueling laws were enforced. The lawless territories settled into respectable statehood. Commerce flourished, and a man's reputation came to rest more on his cash than his courage; and besides, the war had left a backlog of certified heroes who didn't need to prove themselves under further fire.

Dueling lingered in the reckless Far West and the proud-tempered South. It wasn't until 1893 that Joseph Bryan, Confederate hero and editor of the influential Richmond *Times*, rejected a challenge, calling the custom "absurd and barbarous," and was widely applauded for his stand. The custom ground slowly to a halt.

The mahogany cases of pistols went to the attic. As the 20th century dawned, politics became less central to our emotional lives. Manhood could be exercised in making money. Legions of lawyers sprang up to defend our good names in libel suits, less colorful but safer and more profitable. Maybe the Founding Fathers would be proud of us. Maybe they'd feel we've made great strides in honorable behavior. On the other hand, maybe they'd feel we've degenerated into a nation of greedy poltroons without spirit or conviction, unworthy to meet a true gentleman at ten paces.

Here and there, though, the tradition lingered on. In 1959, in Hollywood, Barney Silva, co-owner of a chain of Los Angeles restaurants, experienced irreconcilable differences with jazz musician Jack Sorin over one Dorothy Simon. Resolving to do the thing right, the two men marked off ten paces in Silva's living room, wheeled, and fired. Both died. ♜

*Barbara Holland last wrote on Cleopatra (*SMITHSONIAN, *February 1997). Her latest book is* Bingo Night at the Fire Hall *(Harcourt Brace & Co.). Peter de Sève, a frequent contributor to* SMITHSONIAN, *also designs characters for Disney animated feature films.*

Lhasa through Harrer's lens: monks on the steps of the Potala—the Dalai Lama's home—are dwarfed by a huge *thangka*.

The Strange Journey of Heinrich Harrer

BY LEWIS M. SIMONS

THE AUSTRIAN MOUNTAIN CLIMBER ESCAPED FROM A PRISON CAMP IN 1944, SLIPPED INTO FORBIDDEN TIBET, TUTORED THE DALAI LAMA AND WROTE A FAMOUS BOOK: NOW THERE'S A MAJOR FILM—AND A CONTROVERSY

Harrer is a man who spent the second part of his life hiding the awful truth of the first.

AT 2 O'CLOCK ON THE AFTERNOON of April 29, 1944, seven men—two dressed as English military officers and five as Indian laborers—strode out of the huge British-run prisoner of war camp near Dehra Dun, in the foothills of the Himalayas. To the armed Gurkha guards who saluted smartly, the group—carrying among them a ladder, a bale of barbed wire and a roll of blueprints—appeared to be members of a work party on their way to repair the camp's double wire perimeter.

In truth, they were German and Austrian inmates, among 2,000 enemy nationals who were imprisoned by the British colonial forces in India when World War II erupted in Europe five years earlier. Once outside the camp, the POWs hastily stripped away their disguises, split up and loped off in their own directions.

In Hüttenberg, Austria, his hometown, 85-year-old Harrer has built a miniature "Pilgrim's Path," 500 steps along a cliff past a thangka, rock paintings and rhododendrons.

Almost two years and 600 miles later, two of these escapees—Heinrich Harrer, a gregarious Austrian mountaineer and geographer, and compatriot Peter Aufschnaiter, a quiet, self-contained climber and agricultural engineer, staggered through the towering stone gateway of Lhasa, the forbidden capital of the mysterious kingdom that sat on the roof of the world: Tibet.

During their incredible journey on foot, over 65 mountain passes as high as 18,000 feet and across the hostile Tibetan plateau in the bitter depths of winter, they suffered hunger, dysentery, frostbite. They evaded attempts by wild Khampa tribesmen to rob them. One night, freezing and exhausted, they were overtaken by despair and agreed that if they lived 'til sunrise they'd turn back and surrender. But when morning came, neither mentioned the conversation and they pressed on.

Certainly not as they were setting off from Dehra Dun nor even when they finally reached the legendary city, as dead as they were alive, could the pair have dreamed that they would spend seven years in Tibet, that they'd be treated as honored guests and that Harrer would become a friend and tutor of the child god-king, the Dalai Lama.

Harrer eventually recorded the adventure in a fascinating though oddly self-effacing and understated book, *Seven Years in Tibet*, which was first published in 1953. Today a classic, the book, illustrated with Harrer's own black-and-white photographs, was translated into 48 languages, sold three million copies and made Harrer wealthy enough to begin financing more expeditions around the globe. He has been honored by kings, presidents and his peers as one of the last of the world's great explorers.

Now on its way to a theater near you is a movie of the same name, a $70 million production starring Hollywood heartthrob Brad Pitt as the young Harrer. And another film, this one directed by Martin Scorsese and entitled *Kundun* (translated as "presence," it is the name by which the Dalai Lama is known to his intimates), is hard on its heels. The Communist regime in Beijing has lashed out at the two films' producers, TriStar and Disney, excoriating them for popularizing the "bandit" Dalai Lama. Suddenly, 38 years after the gentle monk, adored by his people as a reincarnation of the Buddha, was forced into exile by the advancing People's Liberation Army of China, Tibet is hot.

And Heinrich Harrer is Tibet's champion. Still athletic and sharp at the age of 85, he has fought over the decades against China's oppression of the Tibetan people and its calculated destruction of their ancient culture. He has traveled the world raising funds for Tibetan refugees and has spoken out against governments, including that of the United States, which he feels coddles the Chinese Communists while turning a blind eye on the Tibetans' condition in order to ensure access to China's booming market. And he has remained in close touch with the Dalai Lama himself, who was awarded the Nobel Peace Prize in 1989.

Harrer has, moreover, become a self-appointed advocate for decency to and tolerance of other downtrodden people. "A naked tribal woman in the

forests of the Amazon," he argues, "must be treated as no less a lady than a grande dame in a Parisian salon. A tribesman smeared with pig fat is no more 'dirty' than a socialite daubed with cologne."

Surely, now should be a golden moment for Heinrich Harrer.

It is not. Suddenly, with the ballyhoo surrounding *Seven Years in Tibet* has come the revelation that Harrer was a Nazi. That he was a member of the SS, Hitler's elite guard, which perpetrated many of the grisliest atrocities of World War II. That he shook hands with Hitler and exchanged confidences with SS chief Heinrich Himmler. Recently discovered records indicate that Harrer did not engage in war crimes himself; he was in India and Tibet throughout the war.

The dark side of Harrer's personal history is not revealed in *Seven Years in Tibet*, nor in any of the 20 other books he's written. It hasn't emerged in the dozens of documentaries he's produced nor the hundreds of speeches he's delivered. There is some hint of it in the movie, over which he holds no control, and which French director Jean-Jacques Annaud describes as his own interpretation of Harrer's "mistake, guilt and redemption."

What follows is the story underlying the book and the film, the story of a man who spent the second part of his life hiding the awful truth of the first. I've assembled this account after speaking at length with Harrer and his wife, Carina, with the Dalai Lama, and with Jean-Jacques Annaud.

Tibet was both the high point and the turning point of Harrer's long and extraordinary life. Almost every person he met, from the poorest nomad living in a black wool tent to the Dalai Lama in the soaring splendor of the Potala Palace, received him—an escaped prisoner, a sick and penniless wanderer—with openness and warmth. This taught him tolerance and cultural sensitivity. But Harrer's regard for his hosts evolved slowly. If he and Aufschnaiter had learned to appreciate Tibetan wisdom earlier they would have saved themselves from the hammers of hell as they trekked for nearly two years over hundreds of miles of some of the most inhospitable terrain on earth en route to Lhasa, risking death almost every painful step of the way. Because the Austrians wanted to evade suspicion that they were bound for the forbidden city, they decided to take a treacherous northern route, ignoring the warnings of nomads that "only lunatics" would attempt this. "Had we had even a faint idea of it, we would certainly have turned back,"

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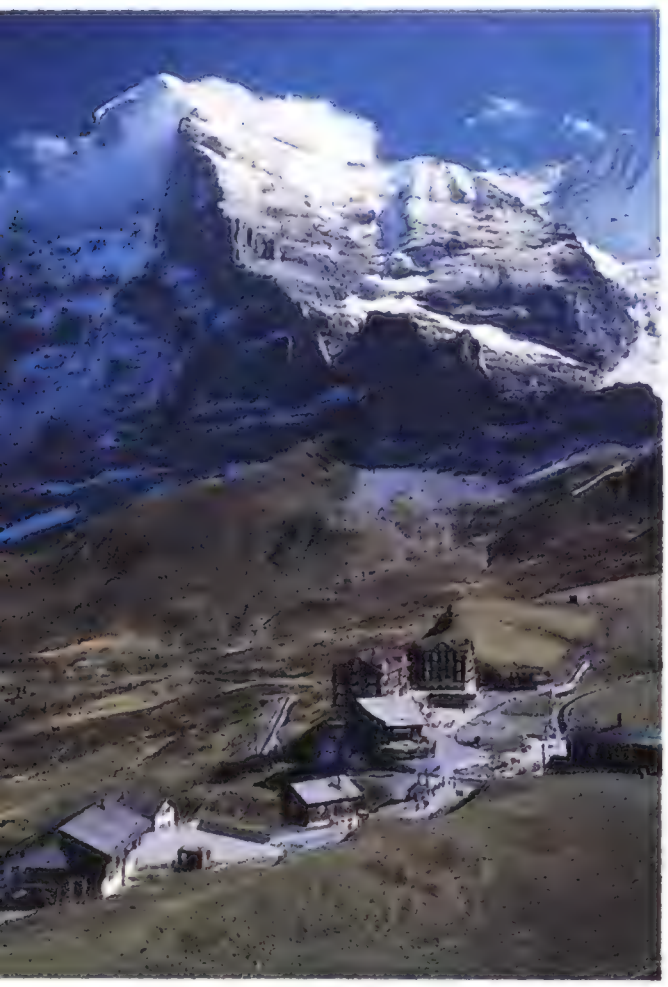
Harrer wrote years later with the wisdom of hindsight.

But luck accompanied them and it certainly stayed with them once they slipped into Lhasa on January 15, 1946, dazzled by the fantastic golden rooftop ornaments of its temples and palace, its maroon-robed monks and fur-coated peasants. "Dead-tired and half-starved," they had collapsed on the ground when an aristocrat named Thangme approached and, speaking perfect English, invited them to his spacious home. In short order, they were fed, rested, bathed, shorn, shaved and dressed in custom-made Western-style suits. The pair, who'd learned rough-and-ready Tibetan on their journey, instantly became the darlings of Tibetan society, invited to all the best parties and salons. "It is probable that no other country in the world would welcome two poor fugitives as Tibet welcomed us," Harrer wrote.

Soon, they were invited to the home of the Dalai Lama's parents, and Harrer became a close friend of the god-king's 14-year-old brother, Lobsang Samten. Through these lofty connections, Harrer gained access to the Dalai Lama. His recounting of the first time he saw the holy child in a religious procession shimmers with the vivid color only an explorer and photographer could capture: "And now approached the yellow, silk-lined palanquin of the Living Buddha, gleaming like gold in the sunlight. The bearers were six-and-thirty men in green silk coats, wearing red plate-shaped caps. A monk was holding a huge iridescent sunshade made of peacock's feathers over the palanquin. The whole scene was a feast for the eyes—a picture revived from a long-forgotten fairy tale of the Orient."



In 1938, Harrer, age 26, and three others were the first to climb the north face of the Eiger (left, in shadow) in the Swiss Alps; Brad Pitt (above) plays Harrer in the film.

The glorious experience ended in 1951, not long after Chinese forces invaded Tibet. Harrer reluctantly outfitted a yak caravan and left the isolated country for India. The Dalai Lama also left Lhasa, although he later returned and tried to come to some workable solution with the Chinese. Aufschnaiter was to stay another six years, eventually going out to Nepal. In 1959, during an uprising in Lhasa, the Dalai Lama fled by night and weeks later arrived in India, where he and a large exile community remain today. "What has happened in Tibet is hardly to be believed," Harrer wrote in an epilogue in 1996. "More than 1.2 million Tibetans lost their lives and of about 6,000 monasteries, temples and shrines, 99 percent were either looted or totally destroyed."

While *Seven Years in Tibet* relates Harrer's penetrating observations of the exotic life around him, it fails to examine huge chunks of his own story. The few scraps he uncovers of his life before being confined in India are brushed off in a vague three-page preface: "All our dreams begin in youth. . . ." Of the prison camp, his keenest insight is that "this is no life for freedom-loving men." And his and Aufschnaiter's reflections on family and old friends are boiled down to a single sentence: "Neither of us had very close ties with our old homes." At one point, Harrer writes, "I would have been happy to bring out a wife from home, but at first I could not afford to do so and later politics intervened." Elsewhere in the book, he refers to himself as a bachelor.

In fact, Harrer already had a wife back home. And a son. He'd married Lotte Wegener, the 18-year-old daughter of famed German explorer and geophysicist Alfred Wegener (who originated the hypothesis of continental drift), on Christmas Eve 1938. (First, SS corporal Harrer, 26, serial number 73896, had to apply in writing to SS chief Himmler for approval to wed, granted once the couple had been found "genetically sound.") By the time Harrer left for India on a German-government-sponsored Himalayan climbing expedition in the summer of 1939, Lotte was pregnant. He didn't know that, he tells me.

The film opens with Harrer, blinded by visions of glory, deserting a very obviously pregnant Lotte. As Annaud has interpreted it, "Harrer was cold

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Top: In the film, Pitt as Harrer is surveying Lhasa when he learns that World War II has ended. Above: Harrer, in Tibet at about the same time, with his Leica.

and ambitious. He walked away from his pregnant young wife because he was totally egocentric. He was, as we say in France, 'ready to kill his own mother.' His main goal in life was to become famous. People didn't matter unless they could help him. He joined the SS because it would help his climbing career. I believe he would have just as easily joined the Communists. He has changed, though. There is no question that he became a better human being from his experience in Tibet."

The golden-haired Pitt plays Harrer with a convincing Germanic accent and a dismissive attitude toward most other humans. As he and Aufschnaiter trek deeper into Tibet, he grows obsessive about his son back in Graz—he supposedly learned of the birth and of Lotte divorcing him by a letter he received in the camp. Yet Harrer told me this was fiction, "just plucking of heartstrings," and that he did not consider his son's absence a hardship. The variables between the book, which is dry to the point of aridity, and the movie's imaginative melodrama, along with the recent revelations of Harrer's wartime record, serve mainly to muddle the historical truth. Still, Annaud is convincing in his account of Harrer's spiritual transformation.

Certainly the Harrer I met in Austria in May was not modest. But despite his accomplishments, he was not arrogant, either. Proud, I'd say. He and his third wife, Carina, picked me up at the small airport of Klagenfurt in their four-wheel-drive vehicle, and we drove to their hilltop cabin above the nearby village of Hüttenberg.

Harrer was born here, when it was an iron-mining center, in the same straw bed in which his mother and grandmother had been born. As a boy, he ran up and down these same hills every day, doing chores for his mother. The exertion, he says, conditioned him for mountaineering and the other sports at which he excelled.

The ordinariness of his childhood inspired Harrer to seek fame and to ride that fame out to the world beyond Austria. He achieved his first measure of widespread recognition by becoming the first to climb the north face of Switzerland's fearsome Eiger. And in Tibet Harrer learned the pleasures of privilege. "There you were someone," he recalled with a distant look. "I had servants and I was a friend of His Holiness the Dalai Lama. In Europe, you were no one."

Although he would never have left Tibet of his own will, Harrer said, he has achieved enduring fame since fleeing ahead of the Chinese Communists. And nowhere is he more honored than in the birthplace he couldn't wait to leave. Everyone for miles around knows him—they call him "Professor." The community has given the curving, climbing road to the cabin his name and has granted him a lifetime supply of water and firewood. "This is my greatest reward," he says, meaning it.

The modest kit-style log cabin, fronted by a broad flagstone-paved terrace, overlooks a gently rolling valley patchwork-quilted with farms and woodlands. Beyond them rise the gray mountains that remind Harrer of a lifetime of climbing. "This," he said with deep satisfaction, "is paradise on earth." The hillside garden is hung with white Tibetan prayer flags, whipped by the stiff Alpine breezes. Adjacent to the cabin stands a 200-year-old wooden granary; Harrer had bought it in a neighboring valley, then had it meticulously taken apart and reassembled here. It holds a small collection of bronze Tibetan Buddha figures, brilliantly painted antique *thangkas* (paintings on lengths of fabric that roll up), wooden chests and 120,000 color slides he's taken all over the world.

A show of 42 of Harrer's most evocative black-and-white photographs of Tibet has been touring the United

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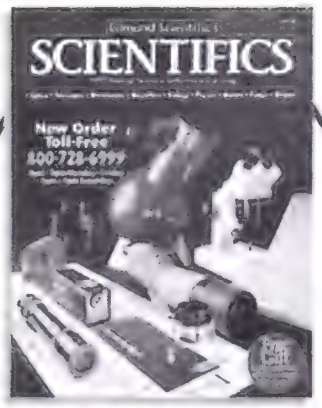

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"We wrapped our feet in every piece of cloth we could find but the pain was excruciating."

States since 1991; many of his photographs also appeared in his book *Lost Lhasa*, published in 1992 by Abrams and available this fall in paperback. Because China has wiped out most vestiges of old Lhasa, the kingdom's sacred city, Harrer's pictures are the last visual record of this dying culture. More of Harrer's Tibetan artifacts are on display in Zurich and in Liechtenstein. But the collection that traces his life around the world is housed in the Heinrich Harrer Museum, a spacious, century-old yellow-brick schoolhouse in Hüttenberg that has been expanded and tastefully decorated. In 1992, the Dalai Lama dedicated the building, which now displays more than 6,000 objects Harrer gathered in Tibet and on subsequent expeditions to New Guinea, Borneo, Alaska, the Andaman Islands, Africa and elsewhere.

Across the road, Harrer has constructed as incongruous a sight as could be imagined in rural Austria: a compact version of the five-mile-long Lingkhor, or "Pilgrim's Path," which circles Lhasa. Even today, the faithful from all across Tibet crawl along the path, prostrating themselves again and again. Over the centuries worshipers have worn grooves in the paving stones with their hands and knees.

Harrer's Lingkhor is built into the side of a cliff and planted with pastel rhododendrons, reminding him of the giant species through which he tramped in Tibet. He climbs the 500 steel steps without puffing, showing off its huge hanging thangka and brilliantly colored traditional rock paintings and explaining his plans for expansion. Each year, some 40,000 tourists visit the museum and clamber along the Lingkhor, breathing new life into the village, which all but died when the mine was closed in 1978.

Carina, at 75, is chic, her large eyes twinkling behind pale-blue, gold-rimmed sunglasses. She calls her husband "Heinie" and with little more than an occasional word or tilt of her head manages to rein in his tendency to talk incessantly. Harrer moves with the loose-limbed grace of the natural athlete that he was in his younger years: world-class mountain climber; member of the Austrian Olympic ski team; champion handball player. At age 46, he was Austria's national golf champion, and he still plays, though now with a higher handicap.

We spent several days just talking. I asked a lot of questions about what wasn't in the book. I felt that many of his responses, polished and quick, were evasive.

Why had he gone to Tibet? "We were treated very well by the British," he said. "But when we were moved to the foothills of the Himalayas, it was like an open invitation to climb and to try to reach the last great mystery of the world."

Clearly he'd downplayed many of the hardships he and Aufschnaiter endured on their trek. Why? Because, he answers, he was impressed by the British-style understatement he observed in prison camp. "Besides, if I'd told everything, who'd believe me?" He recounted, for example, the two of them crashing through winter ice in a swamp and their feet plunging into astonishingly warm water at the bottom. "As soon as we pulled ourselves out our feet froze immediately. They turned brown and then black. We wrapped them in every piece of cloth we could find but the pain was excruciating. I still don't understand why we didn't lose our feet."

Why had he written primarily about the elite of Lhasa, all but ignoring the majority who suffered under the iron hand of feudal masters and abusive monks? "I was telling the story of my adventure," he replied. "It was not my place to interfere in Tibetan politics."

How had he, Aufschnaiter and the

Harrer now admits he joined the Nazi Party as a young man; in this photograph, says *Stern* magazine, he wears a swastika pin.

others been dealt with in prison camp? The British treated them like gentlemen. Scotch and imported cigarettes were available; food was plentiful; there was a library, a 50-member orchestra, all manner of sports—and ample opportunity to escape. Harrer attempted it four times before succeeding. In one particularly spectacular try, he and an Italian inmate were fired on by the Gurkhas as they breached the wire, yet Harrer managed to stay on the run for 38 days before being captured. "I was marched in to the commander, Colonel Williams, and he said, 'Mr. Harrer, I admire you. You made a daring escape attempt. However, under the Geneva Convention, I have to give you 28 days in solitary confinement. Good day.'"

Perhaps the British would have kept a closer eye on Harrer if they realized that he'd been a member of the four-man German/Austrian party that achieved the first successful ascent of the north face of the Eiger, the sheer 6,300-foot stone-and-ice wall in the Swiss Alps infamous for claiming lives. Until Harrer and his teammates reached the peak in July 24, 1938, the north face had been considered virtually inviolable.

The benchmark climb, which Harrer

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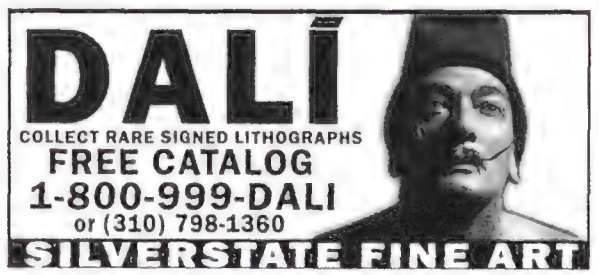

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Harrer snapped this festival grand marshal dressed as a 17th-century Mongol general.

recorded in his book *White Spider*, was no daredevil feat, he told me. "When I climbed the Eiger, I took no risks. For example, I knew when the sun loosened the rocks—it was around 2 P.M.—and so we bivouacked for eight hours in order to avoid the heat of the day. Of course, you must overcome your fears or you never become courageous. But courage doesn't mean doing stupid things and not preparing." Among such "stupid things" Harrer counts "despicable stunts" like bungee jumping and "adventure tours" up Mount Everest by less-than-expert climbers.

The Eiger triumph electrified the mountaineering world. In Britain, which was then the preeminent climbing nation, newspapers quickly seized on the fact that Harrer and the others were summoned to Berlin to receive Adolph Hitler's congratulations. "They wrote that I'd climbed the Eiger 'for Hitler,'" he said. "And they said he'd given me money and a medal." A photograph was published in British papers showing Harrer wearing a lapel button that was described as a Nazi decoration. "Nonsense!" he said. "It

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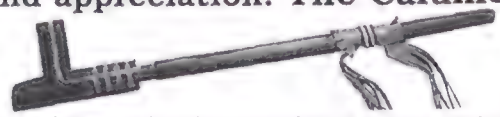

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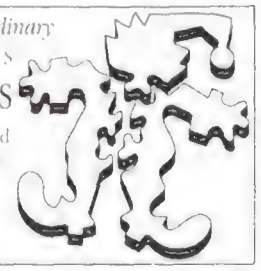

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I met with the Dalai Lama; we exchanged white silk scarves, the traditional greeting.

was the pin of an Alpine club."

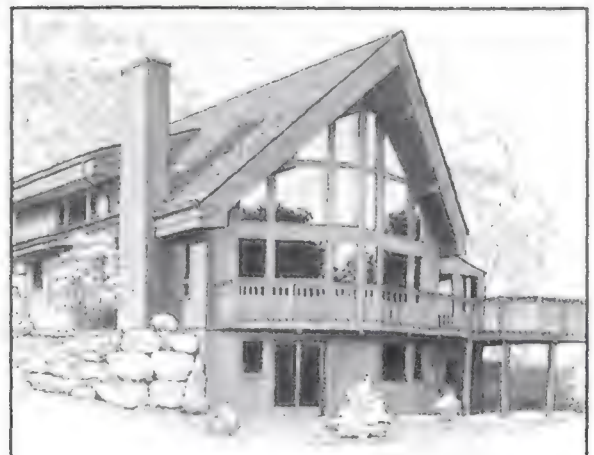
But Harrer's version of those past events was about to unravel. As the three of us spoke on this splendid spring afternoon, the story of Heinrich Harrer and the SS had not yet been broken by the German newsmagazine *Stern*. He did not offer the information that he'd voluntarily joined the SS—on April 1, 1938, between the Anschluss and his assault on the Eiger. Nor did he tell me that for five years before that he'd been a member of the then-illegal Nazi storm troopers in Austria.

In response to another of my questions, Harrer acknowledged shaking Hitler's hand. "Of course I did," he said. "After all, I was a young mountaineer, and he was the new leader of our country. Why wouldn't I shake his hand!" But, he added insistently, "no money, no medals!"

Was he a Nazi? "I've gotten used to these false accusations, but poor Carina still suffers," he replied. When I turned to her, Carina told me that her father had fled the Nazis and waited out the war in Beijing. Afterward, she said, he'd been in charge of arranging Austria's war reparations to Israel. And her first husband was a Jew. I felt that she was telling me she would not have married Harrer had she believed that he was a Nazi—in his heart, anyway.

Harrer had kept his terrible secret from his treasured friend the Dalai Lama. A few days after *Stern* published its story, I met with the Dalai Lama in a hotel suite in Los Angeles, where he was holding a series of "teachings." We exchanged ceremonial white silk scarves—the traditional formal greeting—and he slipped off his sandals and seated himself cross-legged on an easy

In 1951, Harrer photographed the teenage Dalai Lama and his retinue in the Chumbi Valley, where they had fled after Chinese Communist forces invaded eastern Tibet.



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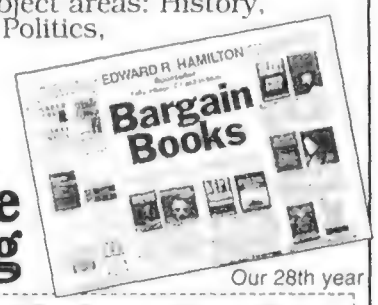

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chair. Then, he addressed the subject uppermost in his mind. "This is so surprising," he said softly, "so unexpected. Could it be true? I really don't know what to think. I have no impression he ever told us anything about meeting Hitler or of any other such activities. I never heard of these things. During his stay in Tibet, everyone liked him."

And that included the Dalai Lama. The mountaineer was 37 and the god-king 14 when their teacher-student relationship began; the Dalai Lama kept hearing about Harrer and was curious to get to know him. "We had an old movie projector and a generator which always broke down," the Dalai Lama recalled. He wanted to try fixing them himself but, he says, "my aides were afraid I'd be electrocuted." So Harrer was asked to come. "In those days, we considered all Westerners to be experts in mechanical things." Harrer, as it turned out, was able to repair the machinery. "We also believed that all Westerners were British and that they, of course, spoke English." Harrer, a German speaker, knew enough English to get by, and soon he was the boy's informal tutor. They discovered that they shared the same birthday, July 6.

"I wanted to talk to him and ask him questions about the West," said the Dalai Lama. "I didn't know much then about Western history or philosophy. Of course, we didn't realize it then but neither did Harrer—he wasn't an intellectual." He laughed loudly and rocked back and forth on his seat. What the Dalai Lama remembered most readily was Harrer's seemingly inexhaustible energy. "He liked to wrestle, climb, play sports." Harrer even taught the Tibetans how to ice-skate; they called it "walking on knives."

Harrer, who was the first white man to be close to the Dalai Lama, recalled how astonished the young boy was by the hair on his forearms. "Henrig," he mispronounced, "you have hair like a monkey." Most important about the relationship, from the Dalai Lama's

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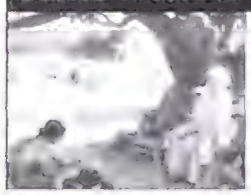

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viewpoint, was the opportunity to exchange ideas with an outsider. In the end, Harrer was unable to convince the Dalai Lama that there was a scientific explanation for the Himalayas, and the god-king was unable to convert the European to Buddhism.

When I asked the Dalai Lama how his relationship with Harrer would be affected as a result of the SS story, he replied, "He always said to me that his seven years in Tibet were the happiest period of his life. Since then, he's kept up close friendships and continually praises Tibet. We've always been grateful to him for this."

It was time now to see what Harrer had to say. I telephoned him in Europe and related the gist of the interview with the Dalai Lama. There was a moment of silence on the line. Finally, he spoke: "I joined the SS in order to coach skiing, but I never gave one lesson to even one SS member. I left immediately for India and then Tibet. This is not an excuse. I don't want to gloss over it. I regret it. I repent. It was one of the greatest errors of my life."

Such a life is not the usual stuff of Hollywood movies. Annaud is that rare director who probes deep beneath the obvious to expose what is hidden. In filming Umberto Eco's brilliant novel of the medieval Catholic Church, *The Name of the Rose*, Annaud says he learned that "the most important thing in a book is often what is not written." For that reason, he says, he was determined to make a film about "the holes" in Harrer's tale.

So, while *Seven Years in Tibet* displays Harrer/Pitt in heroic mode at times—breaking out of prison camp and struggling against the world's most daunting mountains—it also reveals an unappealing opportunist. But neither the film nor the book—and certainly not the octogenarian Harrer himself—peels away many of the layers of this extraordinary man.

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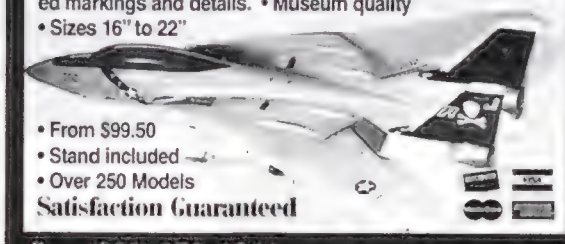
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Proust is high on millions of "someday" reading lists. Yet modern readers barely have time to read their e-mail, let alone tackle a million-word masterpiece. So the French author sits, dipping his *madeleine* in tea, filling space on dusty shelves. If only someone could distill Proust and serve his wisdom as an aperitif.

How Proust Can Change Your Life puts Proust into a witty and wonderful package. As its subtitle reveals, Alain de Botton's book is "Not a Novel." Instead, it's a delightful look at Proust's miserable life and triumphant work. In just under 200 pages, de Botton gives readers the essence of Proust while offering his own quirky views on the perils of living.

At first glance, Proust is an unlikely role model. Sickly, morose, neurotic, he seemed to have been "born without a skin," a friend noted. As the son of a famous doctor, Proust wrestled with failure and depression before beginning his magnum opus at age 38. Yet as de Botton notes, failure is a fine teacher. And Proust's novels provide *beaucoup* advice on how and how not to live.

De Botton deftly sums up Proust's philosophy in nine chapters. He tells us "How to Love Life Today," "How to Open Your Eyes," "How to Be Happy in Love," et cetera. Each elegant chapter is filled with anecdotes and passages from Proust. We learn about Proust's one meeting with James Joyce, his devotion to his illiterate maid, Céleste, his comical hypochondria and his sudden death at 51. Even if the book doesn't change your life, it's both enlightening and erudite.

Proust may have suffered, de Botton notes, but he knew how to "suffer successfully." In his chapter on how to suffer the same way, de Botton psychoanalyzes several of Proust's characters. Charles Swann, hero of *Swann in Love*, is Patient No. 5. Swann's problem: he has received an anonymous letter impugning the honor of his beloved Odette. The solution: Wake up, Charles! Discern the secrets of human character. Or as Proust put it, "when we discover the true lives of other people, the real world beneath the appearance, we get as many surprises as on visiting a house of plain exterior which inside is full of hidden treasures, torture-chambers or skeletons."

Proust wrestled with failure before beginning his magnum opus.

Troubled by the hurry of the digital age? Trust Proust. Anyone who wrote 30 pages describing one night's insomnia can tell you "How to Take Your Time"; Proust was paced solely by his imagination. He read railroad timetables for their romantic suggestion and saw the world in a cookie crumb. He could even dwell on the newspaper, plotting stories hidden in the headlines.

How Proust Can Change Your Life includes zany illustrations. Offbeat 19th-century engravings and portraits from the Louvre put Proust in the context of the fin de siècle. De Botton even measures Proust's longest sentence, finding it "a little short of four meters and stretch[ing] around the base of a wine bottle seventeen times."

Reading *How Proust Can Change Your Life*, we come away wanting to read more, both of de Botton (at 28, the author of three novels) and of Proust himself. Not just for beginners, the book will be appreciated even by those who have conquered literature's heavyweight champ. (I plowed through all of Proust while in the Peace Corps, but de Botton suggests I may have missed something. I should have taken my time.)

If we all knew how to take our time, we might all have time for Proust. But as Proust's brother Robert noted, "The sad thing is that people have to be very ill or have broken a leg in order to have the opportunity to read *In Search of Lost Time*." (He gave a literal translation of the title to his sibling's masterpiece.) Now, there's another alternative. Sip de Botton's aperitif. Then, loving life today, sample Proust. If he doesn't change your life, there's always e-mail waiting.

Reviewer Bruce Watson, a freelance writer, is based in Massachusetts.

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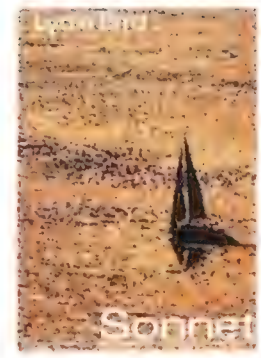
The Perfect Storm

Sebastian Junger

Norton, $23.95



Sonnet

Lydia Bird

North Point, $23

"Meditation and water are wedded forever," wrote Herman Melville in *Moby-Dick*, suggesting that it is metaphysics as much as money or adventure that draws people to risk their lives at sea. Two recent books follow in Melville's wake, offering accounts of life and death at sea that are really meditations on human nature, on how far we can defy the elements, and how much we can know of ourselves.

Both books are by journalists who write for popular magazines such as *Outside* and *Sports Illustrated*, and both reflect the influence of contemporary journalism on our literature. In many ways, they owe more to the genius of Henry Luce than to that of Melville.

In *The Perfect Storm*, Sebastian Junger recounts the last, fatal voyage of the *Andrea Gail*, a Gloucester, Massachusetts, fishing boat that went down off Nova Scotia in 1991. The boat and its crew of six disappeared as a huge storm from the Great Lakes and a hurricane moving up the coast from Maryland collided over it—an event that meteorologists refer to as a perfect storm, meaning that it couldn't be worse, and which Junger describes simply as "meteorological hell."

Junger's portraits of the crew members are vivid, visceral accounts of the life of sailors and skippers in the swordfishing fleet, both at sea and in the harbor towns where they spend all their money, drinking and fighting and making love between voyages. He describes lives that push life to its limits, at sea or ashore. "If the fishermen

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lived hard," he writes, "it was no doubt because they died hard as well. In the industry's heyday, Gloucester was losing a couple of hundred men every year to the sea, four percent of the town's population. Since 1650, an estimated ten thousand Gloucestermen have died at sea. . . . Sometimes a storm would hit the Grand Banks and half a dozen ships would go down, a hundred men lost overnight."

After describing the punishing and dangerous routine of a deckhand's life at sea, Junger adds, "The only compensation for such mind-numbing work, it would seem, is equally mind-numbing indulgence. A swordfisherman off a month at sea is a small typhoon of cash. He cannot get rid of the stuff fast enough. . . . The money is pushed around the bartop like dirty playing cards, and by closing time a week's worth of pay may well have been spent."

In the industry's heyday, the town of Gloucester lost a couple of hundred men every year to the sea.

Around these lives, Junger weaves a tapestry of fact and detail, history and science, commerce and politics, navigation and meteorology that engages the mind as the saga of the *Andrea Gail* going down fixes the heart. This interweaving of information and drama is the mark of Lucean journalism in America, the stamp of *Time*-style on American letters, and Junger is quite good at it. The unfolding tragedy of the *Andrea Gail* is interspersed with fascinating asides on the ice business (without which we wouldn't be eating fresh fish), how sound travels underwater, navigation techniques, the history of the U.S. Weather Service, the mechanics of waves, and so on.

The fabled and treacherous Grand Banks, we learn, constitutes an extraordinary ecosystem, its waters "shallow enough to allow sunlight to penetrate all the way to the bottom. An infusion of cold water called the Labrador Current crosses the shoals and creates the perfect environment for plankton; small fish collect to feed on the plankton, and big fish collect to feed on the small fish. Soon the whole food chain's there, right up to the seventy-foot sword boats."

This is a style that depends on lots of facts and numbers. For example: "A mature hurricane is by far the most powerful event on earth; the combined nuclear arsenals of the United States and the former Soviet Union don't contain enough energy to keep a hurricane going for one day. A typical hurricane encompasses a million cubic miles of atmosphere and could provide all the electric power needed by the United States for three or four years."

Junger is a good storyteller, although he had to reconstruct the events of the *Andrea Gail*'s last days by inference (it lost contact during the storm, so no one knew exactly when or how it sank). He relies on others' accounts of shipwrecks and near drownings, and simply speculates on how the *Andrea Gail*'s crew acted, and how they reacted to their fate. In writing of the crew's dying moments, this technique sometimes leads Junger into soap opera ("These thoughts shriek through the mind during the minute or so that it takes a panicked person to run out of air").

Junger has written an exciting and readable story, but not one that rises from journalism to literature. Maybe what gets lost when Luce replaces Melville as a muse is the metaphysics, the ability to make life and death meaningful in ways that are more memorable than the mere facts.

A different tradition inspires the writing of Lydia Bird's *Sonnet*, an account of her single-handed voyage across the Atlantic in a 42-foot sailboat. Here is the kind of post-Lucean per-

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sonal journalism that prefers the "I" to the "it," threading the world through a needle of subjective experience. The Atlantic that Bird takes us across is not an objective sea of facts but the watery realm of a writer's psyche.

Bird's account is expanded from the diary she kept during the voyage, recording everything from engine problems to her dreams. There are heavy seas and storms, windless days and equipment failures to cope with, but throughout Bird's narrative most of the drama is psychodrama. She writes of her marriage, her parents, her boat, but her mind is on her moods. From Maryland to the Azores, she is alone; on the rest of the passage to Greece she is joined by other women. Yet neither solitude nor intimacy seems to help Bird escape her own afflictive emotions. "Tough passage," she notes in one entry. ". . . Fighting demons, not big seas." There is some fine writing in these pages. At her best, Bird can sketch in an immense seascape with a few strokes, as she does in this entry: "No ships, little speed, blue sea and sky, happy. Leg exercises, book to read, slosh of water."

But more often the prose is awash in waves of introspection. After she has made the passage from the New World to the Old World, she retreats belowdecks for a major cry. "It was having crossed an ocean without feeling a flush of success," she explains. "It was doing this thing I'd wanted so intensely to do, without really feeling I'd done it."

When Melville wrote that "Meditation and water are wedded forever," this was not the sort of meditation he meant. In Bird's watery world, metaphysics has been eclipsed by a kind of postmodern absorption with self. While the tale of her voyage is engrossing, a more expansive view of the world would have served her—and her readers—better.

Freelance writer Paul Trachtman lives in rural New Mexico.

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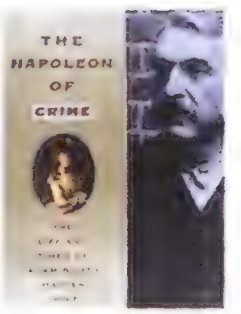

The Napoleon of Crime: The Life and Times of Adam Worth, Master Thief

Ben Macintyre
Farrar, Straus and Giroux, $24

"Bad poets," said T. S. Eliot, "borrow. Good poets steal."

He himself borrowed or stole the epithet "Napoleon of crime"—familiar to all Broadway-goers today as applied to that boss of *Cats* bosses, Macavity—from Sir Arthur Conan Doyle, whose Sherlock Holmes in 1893 had applied it to his perpetual antagonist, Professor Moriarty. Lurking behind these two literary figures, there was a real-life supercriminal who could have given lessons to both Eliot and Doyle.

His name was Adam Worth; a dapper, cerebral and ambitious little man, he had come from nowhere—specifically, the mean backstreets of Cambridge, Massachusetts—to become the most successful safecracker and bank robber in the city of New York, which in 1865 boasted 53,000 crimes of violence. Dissatisfied with a mere local notoriety, and seeking to escape the notice of Pinkerton detectives, in 1869 he borrowed or stole the name of Henry J. Raymond, late founder-editor of the *New York Times*, and sailed to England where he transformed himself into an elegant English gentleman, with a flat on Piccadilly, a steam yacht, racehorses and an international syndicate of robbers and forgers. For years he drove the world's police forces to distraction with well-planned, bloodlessly executed crimes all the way to Port Elizabeth in South Africa, without ever leaving a bit of incriminating evidence.

There was no evidence to connect him to the theft of Gainsborough's portrait of Georgiana, duchess of Devonshire, from Agnew and Sons, a London gallery, on the night of May 25, 1876. It was a glorious portrait, by a painter at the height of his powers, of an alluring young duchess who occu-

pied much the same position in London society and gossip in 1787 as her collateral descendant, Diana, Princess of Wales, held two centuries later, until her tragic death.

Previous to the theft, the portrait had disappeared for some 50 years, to turn up in the home of a Mrs. Maginnis, who had scissored off the legs so that the painting could fit over her mantelpiece. There it was discovered in 1841 by one John Bentley, London art dealer, who, after some earnest haggling, bought it for 56 pounds and subsequently sold it to a collector named Wynn Ellis. Upon Ellis' death, art dealer William Agnew bought it at auction for the extraordinary price of 10,000 guineas. Agnew then agreed to sell it to Junius Morgan, who wanted a "princely" present for his son J. Pierpont, for $50,000, the highest price any painting had yet fetched. But before Mr. Morgan could take possession, the painting had been cut from its frame by Adam Worth.

For years, Worth drove the world's police forces to distraction, from Great Britain to South Africa.

For the next 25 years Worth would hold on to the duchess, whether because he had fallen in love with her, as he had once fallen in love with Kitty Flynn, the Liverpool barmaid whom he had launched as a society lady, or because the duchess was too hot an item to put on the market. When he traveled, the rolled-up portrait was in the false bottom of his trunk. In London he slept with the canvas stretched out flat between two boards beneath his mattress.

The tale of this classy scoundrel has been resurrected from old newspapers and the files of the Pinkerton Detective Agency by Ben Macintyre, Paris bureau chief for the *Times* of London, whose office windows look across the Place de L'Opéra into the building where Worth and Kitty Flynn once ran the American Bar, an illegal gambling den, that for years packed in tourists from the States and criminals from all over the world. It turns out to be a highly moral tale, with a happy ending to boot.

Worth was eventually done in—perhaps by an arrogance that led him to believe he could get away with anything, including a daylight robbery of currency from an express van in Liège. He was nabbed by police, deserted by his accomplices, betrayed by an old rival, and spent five miserable years in a Belgian jail. Adding insult to injury, one of his erstwhile accomplices took advantage of Worth's absence to seduce his wife and steal everything she owned in the way of jewels and racehorses.

It broke Worth's spirit and his health. In his last sad, alcoholic years he cemented his friendship with William Pinkerton, with whom he had played cat and mouse for almost half a century. In 1901 they worked out a somewhat questionable plan for the Agnew gallery to get back its portrait for an undisclosed sum, no questions asked. Worth tried to design a burglar-proof safe, but nothing came of it, and he died broke, while Pinkerton left an estate valued at $15 million.

As for the duchess, she was sold to J. Pierpont Morgan for a price Macintyre reports as £30,000 in one place and $30,000 in another. In 1991 she went on the auction block at Sotheby's, to be knocked down for $265,500 to a proxy for the present duke of Devonshire. And now she hangs in the ducal seat of Chatsworth House.

It is comforting to know that real life can follow Hollywood movie plots to the letter. Crime may not pay, but it can provide a rattling good story.

Robert Wernick, who writes from Paris, is a frequent contributor to SMITHSONIAN.

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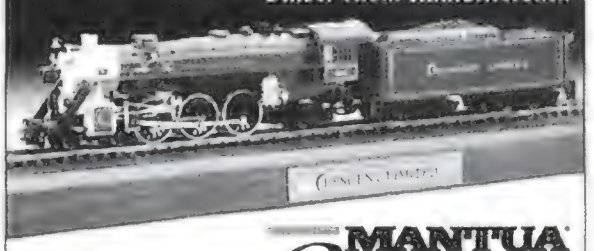

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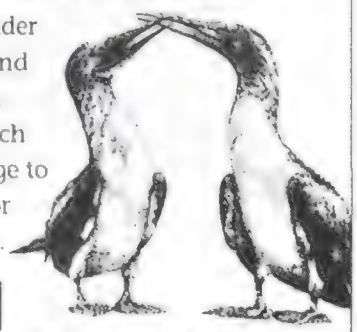
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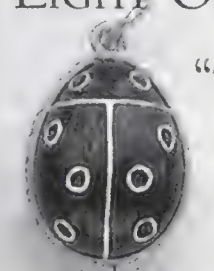
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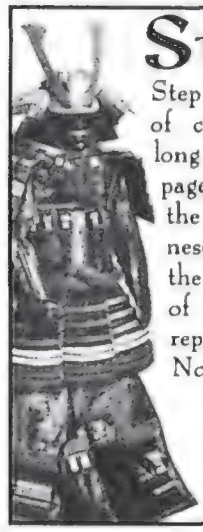
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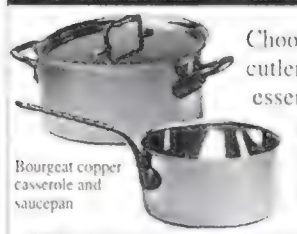
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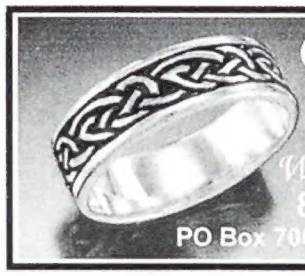

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"Hey, Mr. White, that's the wrong color for that"

BY ROBB WHITE

As hard as you might try, it's not easy to keep folks from finding out that you're color-blind

I HAVE BEEN COLOR-BLIND ALL MY LIFE. Color blindness is a sex-linked genetic dysfunction; about 8 percent of the men in this country are color-blind compared with hardly any women. A lot of people can't resist interrogating men like me. It isn't uncommon for us to have someone we've never seen before thrust a portion of clothing at us and demand, "What color is this?"

I was a middle school teacher for a long time in a small Southern district where most of the students were black. At first I tried to hide my disability. Although I drew elaborate color graphs and illustrations on the chalkboard, I did it early in the morning when the teacher next door could help me select my chalks. At that time, I thought I was smart enough to wiggle out of questions like, "Mr. White, what was it you said that pinkish-magenta stuff under that yellowish-mauve thing right there by the purple blob was?" "Can anyone help Angelica with that question?" was one of my responses. "Angelica, could you come to the board and point to the structure you are talking about so everyone can see it?" was another. And how about: "What do *you* think it is?"

None of my schemes worked, so finally I just admitted it right at the start. "Hello, I am your science teacher. My name is Robb White. I am color-blind. Any questions?" "What do you mean by that?" was one immediate response. I answered: "The normal structures of people's eyes that detect color, especially red and green, are missing from mine." "What color am I?" was another question. "The right color," I always said.

Most of our students hadn't had much opportunity to develop compassion for the problems of white people, but they became my allies anyway. "Hey, Mr. White, that's the wrong color for that. I hate to hurt your feelings, but I just can't stand it." All through the school year, things would occur to them. "Mr. White, how can you tell if a white woman gets shy and blushes?" Answer: "Skin gets kind of shiny looking." "How about a black woman, Mr. White?" Answer: "Same thing." "Can you tell when white people get sunburned?" Answer: "Sure, if you poke them with your finger, the skin there stays extra white for a while. Otherwise, they just look sort of miserable and tired."

My sister's son is color-blind, too. When he first started school, his teacher sent a note home saying she thought he needed to have his I.Q. tested because he seemed unable to learn his colors. I showed the poor boy that the names of the colors were written right there on the crayons and all he had to do was read them. I looked forward back then to having some color-blind companionship when he grew up, but now that he is an adult I find that all we do is argue about what color something is. One lady, overhearing a discussion between us during a parade, said: "You know, y'all ain't making a bit of sense with all that."

My grandfather was color-blind. He was a formidable man. Both of his daughters were pretty old before they got married because he intimidated their beaux so. Anyone who knew he was color-blind would not have dared to grab a portion of clothing, thrust it at him and demand to know what color it was. Long after he died, I was talking to one of his old employees about snakes. The fact came out that I had to use ways other than color to tell which snake was which. "You know, Mr. Jim was like that," said the man, looking around to make sure my grandfather's ghost wasn't lurking in the vicinity. "We never let on that we knew. When he would get to going on about this pink this and this pink that, everybody just agreed with him. They don't do that for you, do they?"

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